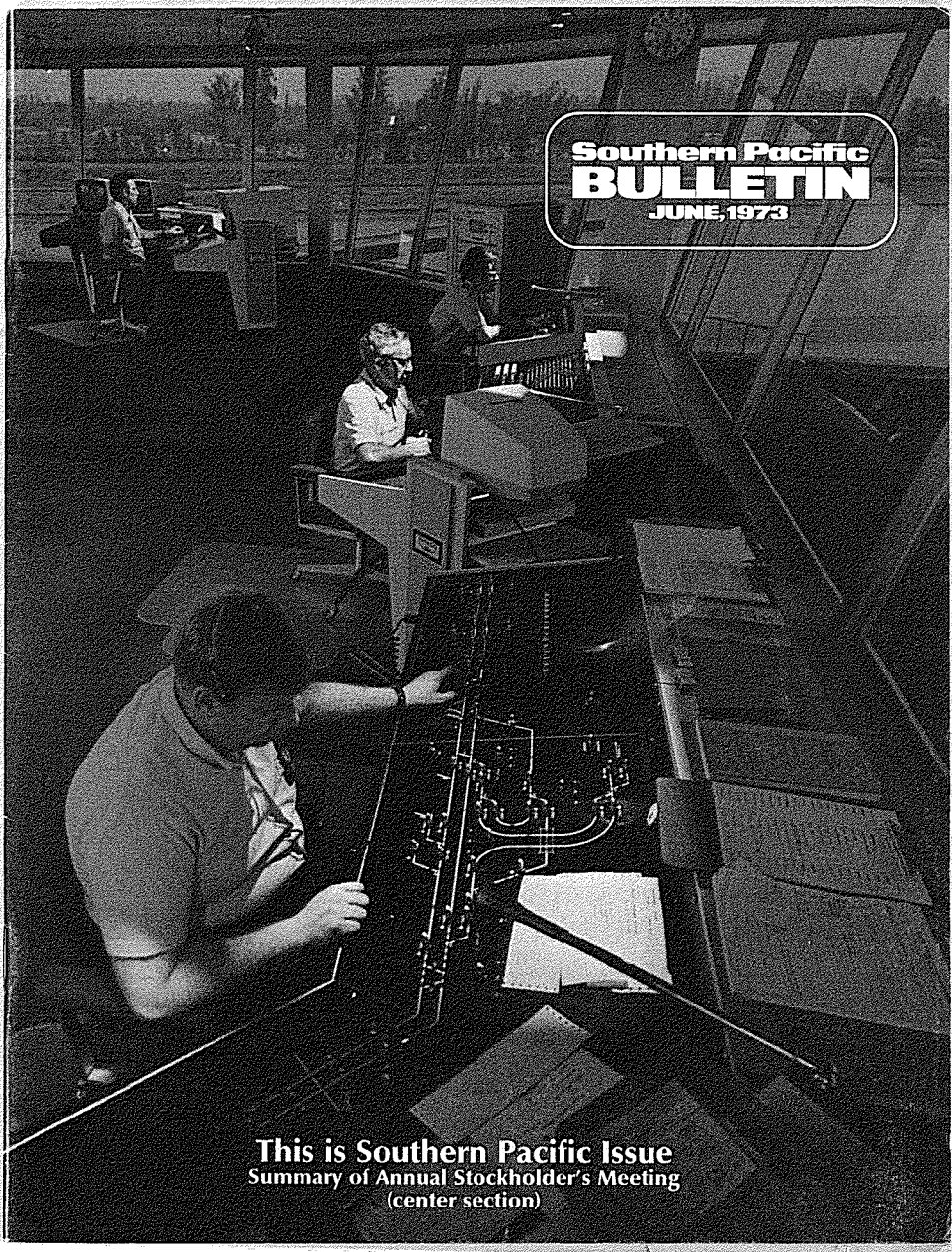


Southern Pacific BULLETIN

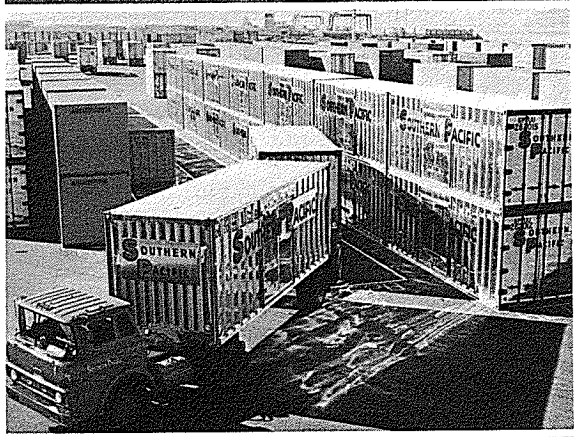
JUNE, 1973

This is Southern Pacific Issue

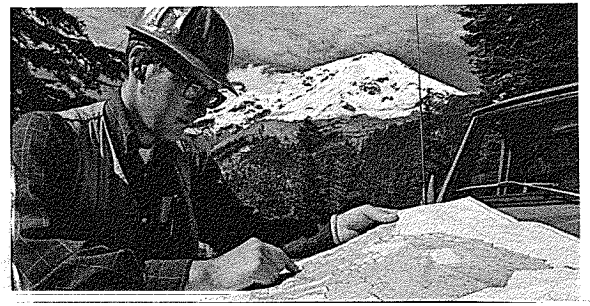
Summary of Annual Stockholder's Meeting
(center section)

Southern Pacific is...

. . . a modern, innovative railroad, serving 12 Western and Southwestern states with about 850 trains every day, working on 13,600 miles of main line (p. 5). It aims fresh thinking at its customers' overall transportation needs (pp. 6-9). It puts its dollars where they'll do the most good, on research, new equipment and technologically advanced facilities to improve train service (pp. 10-15) and to protect the environment (pp. 28-29). SP's 87,000 cars and 2,400 diesel locomotives, if lined up on a single track, would stretch over 1,000 miles, enough to go from Los Angeles across California, Arizona, New Mexico and into Texas, as far as 150 miles east of El Paso.



. . . more than a railroad. It's the transportation company that does things *first*, the most diversified one in the United States. Its truck services operate 8,000 highway units over 27,000 miles of routes (p. 21), and Southern Pacific's varied intermodal services include piggyback/container operations that move 250,000 units a year (p. 22). And its six-state, 2,750-mile pipeline network moves 530,000 barrels of refined petroleum products and up to 15,000 tons of coal in slurry form each day (pp. 24-25).



. . . a forward-looking land management company, responsible and conservation-minded in its stewardship of thousands of acres of Western land (p. 30). Its professional staff manages forest, agricultural, range and mineral lands for their highest long-term potential (pp. 31-32). It directs development of industrial parks and districts needed for expanding industry (p. 33) and supervises the lease and upgrading of thousands of acres of good urban and commercial real estate no longer needed for transportation purposes (p. 34).

. . . the parent of several companies formed to market proven technologies and experience developed in the transportation business. One offers computer and consulting services based upon Southern Pacific's sophisticated Total Operations Processing System for management information (pp. 16-17). A specialized, common-carrier telecommunications company is based on SP's experience with its 6,800-mile microwave network, the nation's longest private system (p. 26). Another is one of America's leading industrial equipment leasing firms (p. 25).

. . . most important of all, a large group of very capable, energetic professionals, hard hats and eggheads, who make the whole thing go. The Southern Pacific family of companies offers many career opportunities and outstanding training and educational programs (pp. 19-20). Southern Pacific people are valued citizens in their communities (p. 19), who for more than a century have been instrumental in the great historical growth and development of the American West and Southwest (pp. 35-38).

COVER: The crest control tower at Southern Pacific's new $39 million West Colton freight car classification yard, the most technologically advanced in the world (pp. 12-14).

Southern Pacific Company itself is a publicly owned holding company with all these diversified interests in transportation, land management and development, leasing, communications, and computer and consulting services. Its largest subsidiary is **Southern Pacific Transportation Company** (see chart, p. 39).

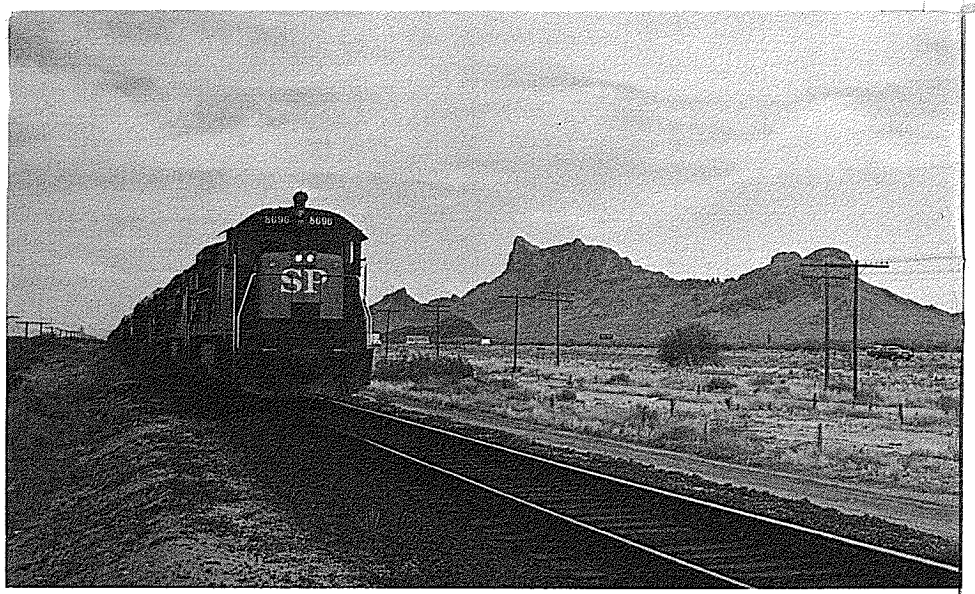
An organization which has led the way in many services for the public, Southern Pacific in 1972 put a record $290 million to work in capital improvements, including leased equipment. In the past 10 years, its investments in such advancements have totaled close to $2 billion.

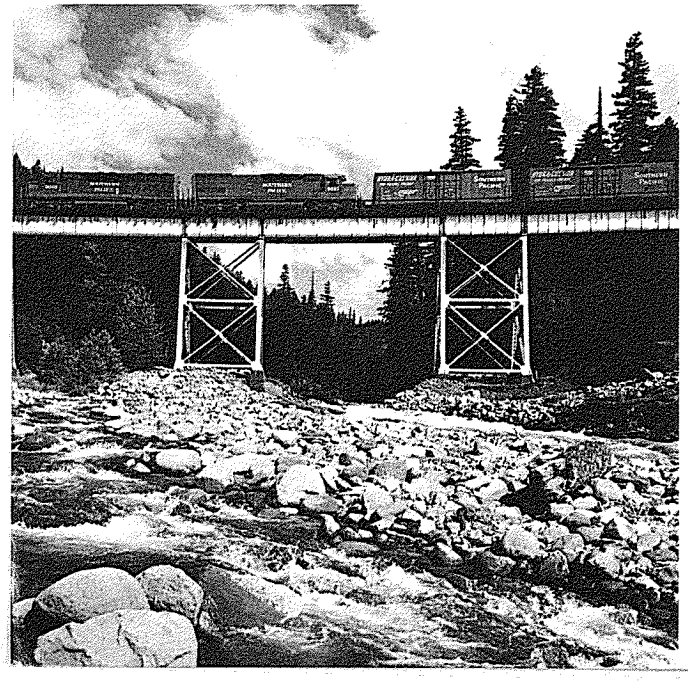
Last year, Southern Pacific also recorded its highest total assets, revenues, and profits. By most standards of comparison, Southern Pacific—with the most diversified transportation system in the nation and assets of nearly $3.3 billion—ranks among the top 50 companies in the United States. It develops annual operating revenues nearing $1.5 billion, and its 1972 net profit of $108.2 million led the list of all American transportation firms.

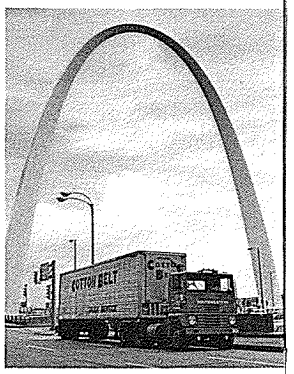
Southern Pacific is a major economic factor in the 12-state "Golden Empire" it serves. Its low rates and pioneering service have kept Western industry and agriculture competitive in transcontinental markets. And SP industrial developers have helped more than 6,000 new industries find plant sites along Southern Pacific rail lines in the last decade, bringing along a $4 billion investment in new taxpaying business and about 218,000 new jobs.

Southern Pacific is a heavy contributor to its territory in many other ways. Last year it spent $685 million in wages and benefits to employes, purchased more than $412 million in materials, supplies and new equipment, and paid a total of $184 million in taxes to federal, state and local government, including 6,846 taxing units such as school districts. While Southern Pacific earned $4.06 per share for its stockholders in 1972, and paid them $2.08 a share in dividends, it paid $6.92 a share in taxes of all forms.

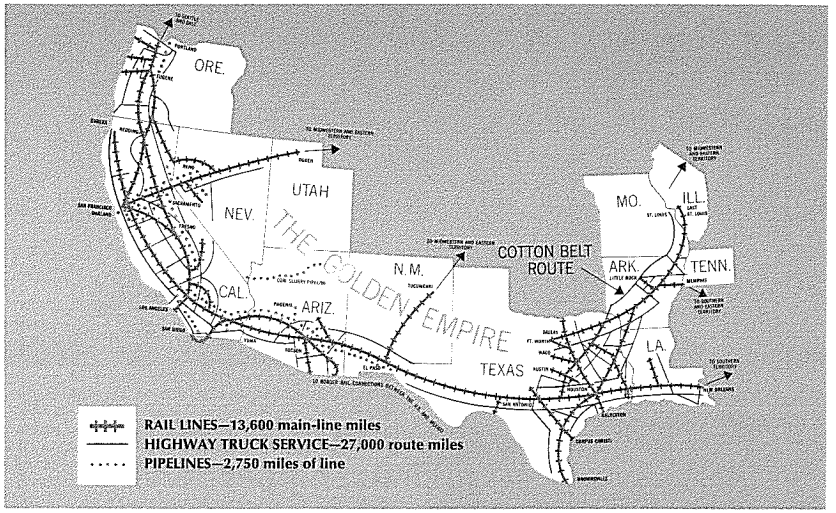
Owners of Southern Pacific live in all 50 states, three U.S. territories and 39 foreign countries. There were 78,082 registered stockholders, with a total of 26,671,930 shares, at the end of 1972, but since many were brokerage firms or nominees holding stock for numerous individuals, it is estimated that SP actually has about 105,000 shareowners. They include many educational and charitable institutions, and more than 6,000 employes who purchase stock through company-sponsored investment plans. More than half the stockholders own 100 shares or less, and thousands of individuals are represented in larger holdings—by mutual funds, for example. Since SP's borrowed capital comes largely from insurance companies and pension funds, countless others have an indirect investment in Southern Pacific.







Southern Pacific's transportation routes serve 12 states. In Arizona (top), fast transcontinental train passes Picacho Peak, near Tucson. In Oregon (left), trainload of forest products crosses Salt Creek bridge. In Missouri (above), truck of SP's Southwestern Transportation Company subsidiary delivers shipment near the Gateway Arch in St. Louis.



The Golden Empire: a Fine Place to Work

The 12 states that Southern Pacific serves, spreading from the Mississippi River and Gulf Coast across the Southwest and West to the Pacific Ocean, cover an area of 1.2 million square miles. That's equal to the size of France, West Germany, Spain, Italy, Austria, Greece, Switzerland, Belgium, the Netherlands, Denmark, Norway, Ireland and the United Kingdom combined.

Southern Pacific's territory encompasses the resource-rich states of California, Oregon, Nevada, Arizona, Utah, New Mexico, Texas, and Louisiana, and extends, along the Cotton Belt route of its **St. Louis Southwestern Railway Company** subsidiary, through Arkansas into Missouri, Tennessee, and Illinois. The 1,441-mile Cotton Belt, the 315-mile **Northwestern Pacific Railroad** in California's north coast redwood country, and the **San Diego & Arizona Eastern Railway,** whose 171-mile San Diego-El Centro route dips across the border into Mexico, are among subsidiaries which operate under their own names but help make up the SP system.

This is truly the "Golden Empire" described in Southern Pacific advertising. It has immense and varied natural resources, productive farms, forests and mines, and modern, expanding industry. It has strategic routes of commerce, marvelous scenery, important educational and scientific centers, and creative and energetic people.

It is a growing marketplace of 66 million persons, accounting for about a third of the country's population and gross national product. The area's productivity, in fact, outranks all but a handful of entire nations.

The Golden Empire produces a major share of many of America's most important commodities: 88% of all copper, for instance, and 65% of the cotton, 97% of the rice, 75% of the oil, 83% of the natural gas and 40% of the lumber. Its farms and orchards produce 85% of U.S. lettuce and grapes, and large percentages of our tomatoes, melons, citrus fruit, peaches, pears, carrots, celery, asparagus, onions, strawberries and other foods ranging from raisins and avocados to salt and garlic.

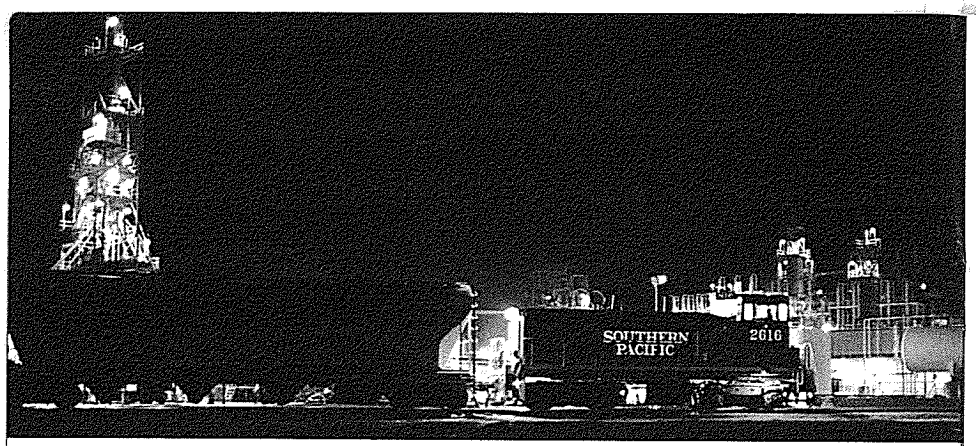
The area's economic wealth and growth have rewarded Southern Pacific's transportation system with a diverse traffic mix which helps balance temporary ups or downs in any one part of its business. Manufactured goods (both inbound and outbound), forest products, farm goods and processed food, petroleum, chemicals, ores, and metal products—each provides a substantial fraction of SP's balanced traffic revenues.

International trade, particularly with Pacific Basin countries and Mexico, also helps invigorate the economy. Southern Pacific serves 36 ports of entry, more than any other U.S. railroad.

In short, Southern Pacific enjoys both a splendid territory, with long-haul routes and great gathering areas for freight, and also the position of being the busiest and largest transportation system in the states of California, Texas, Oregon, Arizona, and Nevada.

It will get busier. As the American economy grows and our standard of living moves higher, transportation needs grow apace. Over the past 30 years, total freight traffic of all modes increased four times faster than population.

The nation's total transportation demand is expected to climb about 50% in this decade, and Southern Pacific expects the fast-growing Golden Empire to continue to exceed the national rate. It'll take some doing to keep up.



First Rule of the Transportation Company That Does Things First: Shipper Service

Southern Pacific views transportation service in the broadest terms.

It looks at the *total* transportation picture which its customers face—all the costs and opportunities of movement from raw material sources to manufacturing plants, to distribution centers, and finally to points of sale.

It encourages customers to look upon transportation as a *reducible* cost and to call upon SP to help find ways to purchase more transportation service for the distribution dollar.

Industrial managers are cost conscious, and transportation costs are visible ones, usually representing a critical part of a company's profit-and-loss record. Virtually every carload of business on Southern Pacific's rail lines, or truckload on its highway carriers, or barrel of fuel in its pipe lines, is moving because the total impact of that service makes it the best available transportation buy.

Industry and agriculture in the West and Southwest must meet market competition all across the country. Often their competitors are much nearer major markets, such as the big consuming centers of the East and Midwest. Southern Pacific's dependable, fast service, modern fleet of specialized equipment and low rates are planned to help them meet this competition.

Southern Pacific endeavors to provide the service, or service combination, best suited to the individual customer's needs. Most important, it tries to anticipate changes in the customer's requirements and offer timely and appropriate new programs. SP may even take a hand in his logistical planning from the outset, by helping pinpoint the best location for a new industrial plant or warehouse.

This shipper-oriented approach is why SP spent years developing a multi-purpose computer/telecommunications system—now a model for the industry—from which specialists are evolving exciting new capabilities.

It is why SP built pipe lines when it foresaw shipments of petroleum products approaching volumes which would permit pipe lines to reduce rates.

The underlying philosophy is why Southern Pacific has become the most diversified transportation system in the United States and as truly a "supermarket" of transportation as federal regulatory practices presently permit. And it is why SP believes it would be in the public interest if *any* transportation company could offer the public whatever service, or intermodal combination, would best do the job.

Research in both marketing and technology have led to many Southern Pacific breakthroughs, and no railroad has accomplished more with such projects. SP has even commissioned research to find out where it should be doing research.

Numerous SP "firsts" in rail car design are a case in point. Novel loading techniques feature the successful "Stac-Pac" and "Vert-a-Pac" systems developed by Southern Pacific and General Motors to protect new automobiles from in-transit damage from vandalism and weather (page 10). By loading nearly twice as many sub-compact autos in the Vert-a-Pacs as in the usual tri-level auto racks, SP also was able to attract more traffic with lower rates.

A similar combination of equipment and rate innovation is a unique unit train to carry coiled steel used in automobile manufacture 2,188 miles from a Southern California steel mill to Illinois, the longest run of a single-commodity unit train in the nation. The 52-car train departs every seven days with 5,000 tons of steel. The steel mill is able to compete in a far-off market because it earns one of Southern Pacific's unit train rates, and because special SP-designed cars permit payloads of 100 tons and handle coils ranging from 34 to 84 inches in diameter without tie-down devices. The shipper's gantry crane, run by a single operator, can load all 52 cars in 24 hours.

The Hydra-Cushion underframe for freight cars, to reduce damage to fragile loadings, was a research success of SP mechanical engineers and Stanford Research Institute in the 1950s. Now Hydra-Cushions are common in many railroad car fleets. About 40% of SP's box cars are so equipped, and SP has included these cushion underframes on all its recent orders. Higher car costs should be offset by savings in maintenance and claims.

New railroad equipment is bigger, better and more costly. Good utilization is a must, because nowadays a Hydra-Cushion box car costs $19,000 and up, a mechanical refrigerator car $38,000, a Vert-a-Pac car about $55,000, and a freight diesel locomotive unit nearly $400,000.

Capacity of the country's new freight cars averages 81 tons (vs. 61 for old cars being retired). SP, over the years, has helped hold freight rates down by encouraging heavier loadings in the high-capacity cars and so boosting per-car efficiency.

This type of equipment-rate combination recently made savings possible for Arizona and Texas copper producers. SP invested $6 million in 300 heavy-duty, 100-ton box cars designed to move heavier loads of semi-processed copper products. Now, by loading these cars more heavily than possible before, shippers can reach their Eastern customers with a saving of 10% on their freight rates, a total of over $2.5 million a year.

Recent SP studies led to rate reductions in California for movement of scrap iron and steel, provided the shipper could furnish his own cars. Several are doing just that.

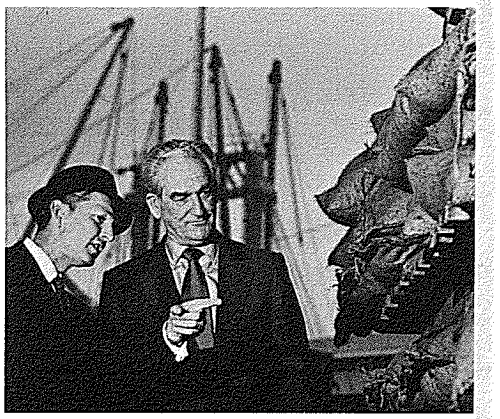
Rail rates are still a bargain, despite inflation and rising costs. From 1963 to 1973, the average price of all commodities went up 37%, as did the cost of rail equipment. Farm products increased 68%, processed foods 53%, iron and steel 39%, lumber 115%, and coal 121%. Yet the average railroad freight charges in the same 10-year period went up only 24%.

Part of the Assembly Line

A major transportation system these days becomes, for all practical purposes, a part of its customers' assembly lines. The competitive pace of industry demands that shipments be coordinated precisely with production and distribution schedules.

Appliance manufacturers, for example, arrange deliveries direct to chain stores to coincide with sales promotions. Savings in their warehousing and handling costs often are reflected in the prices consumers pay over the counter.

Automobile manufacturers use railroads to tie together their geographically separated production facilities. SP shuttles auto parts and new cars in full unit trains between



Railroading is a 24-hour service, as indicated by the SP switch engine (opposite) spotting cars in Houston petrochemical plant.

Southern Pacific traffic representative (top) points out details of loading arrangement to customer at a West Coast port.

SP Pipe Lines moves petroleum products under San Francisco Bay to its Brisbane tank farm (center), then pumps jet fuel to San Francisco International Airport. If this moved over the highways to this busy airport, about 6,550 trucks per month would be needed.

Expedited piggyback train heads out of Northern California for Portland with vans of merchandise for next day Northwest delivery.

Eastern parts factories and West Coast assembly plants, on exacting timetables.

An auto assembly plant has very little inventory of parts in storage. It counts on the box car of rear fenders to arrive when and where it's supposed to, or the whole assembly line might have to shut down. To make sure this doesn't happen, both the railroad and the automobile company monitor all the bits and pieces of traffic through computers. The carrier's information services, as well as train performance, must be good.

Southern Pacific's information system *is* good. TOPS (for Total Operations Processing System) is another SP first, and is the most advanced and complete "real time" computer and telecommunications system in the transportation industry. It was introduced in 1968, after eight years of research and development, and ever since then this successful system has given Southern Pacific management a host of valuable tools to improve performance, SP's customers instantaneous information on the progress of their shipments, and other railroads working programs for compatible data interchange in the industry (see page 17).

Some 390 shippers with many cars moving subscribe to SP's CARLOC program. TOPS computers automatically assemble concise, standardized reports on the location of these cars at intervals of 8 to 24 hours, and send them through SP traffic offices to individual customers. Many enter these current status reports directly on their own computer systems.

SP computer systems also provide automatic reports to customers of delays due to mechanical defect and assist the railroad's rate and sales people in analyzing traffic flow and planning improvements.

Intermodal Competition

Transportation is an intensely competitive business. In recent decades, the proliferation of new services and whole new capabilities, such as air freight, has given the shipping public a wide choice in picking a carrier. Each mode of transportation offers certain inherent advantages and each carries different costs.

These differences vary greatly, according to individual circumstances, commodities and routes. It's often hard for an industry to compare full costs and service qualities, for example, between using common-carrier railroads, trucks or piggyback, and setting up its own privately-operated truck fleet. Common carrier tariffs are published, but the prices of unregulated or contract trucks, or those of organizations like farm cooperatives, are not. Factors may change quickly; opening a new interstate highway or public port facility may instantly revise cost and service patterns of many competitive carriers.

The industrial traffic manager's job is to minimize the total cost of distribution to his firm. Freight charges are only one element that he considers in picking a particular traffic mode, or a particular carrier, to do the job. He looks at service reliability, flexibility for such things as break-bulk or multiple deliveries, size of shipments, transit time, the possibility of loss or damage, and how any of these factors may affect his firm's own sales, warehousing, inventory or tax situations.

In a new Southern Pacific sales and marketing program, called its "intermodal early warning system," varying dollars-and-cents factors which go into customers' choice of carriers are built into mathematical models.

The program, which includes special studies of how best to transport various commodities, is the continuing product of SP task forces combining the disciplines of SP specialists in sales, traffic research, rates, analytic and systems research, commerce law, trucking and intermodal traffic.

The analyses this program develops are showing some customers how to save money and can also tell SP management where service improvements can be expected to capture new business.

Rolling Refrigerators

Getting fresh fruits, vegetables and frozen foods to market in prime condition is one of the staples in Southern Pacific's balanced transportation diet.

Shorter-lived edibles—lettuce, tomatoes and melons are familiar examples—and frozen foods travel in the rolling refrigerators of **Pacific Fruit Express Company,** a subsidiary owned jointly by Southern Pacific and Union Pacific.

The business of supplying fresh produce for the American dining table began in 1886, a year that can also be called the birth date of the Western fruit industry. It was then, for the first time, that a practical way was found to move quantities of fresh fruit across the nation, with the first railroad cars designed with ice bunkers. Its two railroad owners formed Pacific Fruit Express in 1906.

Today, SP and PFE move about a billion heads of lettuce a year, the great majority of all that's shipped in the nation. They handle 60% of the table vegetables, 76% of the melons, 59% of the grapes, 36% of the citrus, and more than a billion pounds of frozen foods a year.

To do this, PFE, the country's largest refrigerator car line, has a fleet of more than 13,000 mechanically refrigerated rail cars—more than half the national supply—and 1,500 piggyback trailers.

Mechanical refrigerator cars have self-contained diesel engines which can be pre-set for constant temperatures ranging from below zero to plus 70 degrees F. (in certain winter conditions, warm air may be needed).

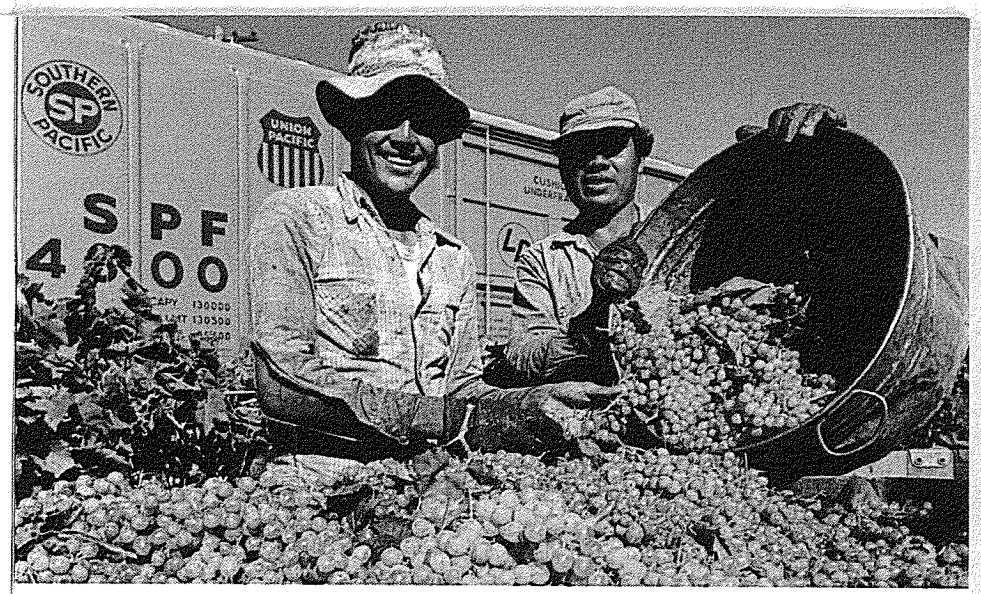
PFE has been acquiring the mechanical cars since 1953 and has been able to phase out ice-cooled "reefers," which required daily stops for re-icing. With their greater efficiency and capacity, the 13,000 mechanical cars are doing more work, and better, than nearly 40,000 ice bunkers once did.

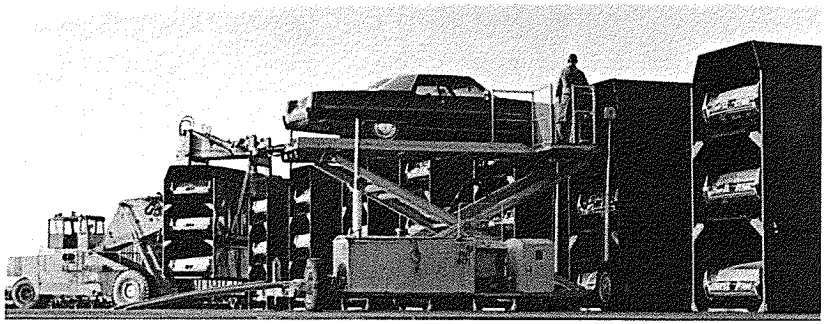
Shippers need a lot of specialized equipment, like these hopper cars being delivered near downtown Houston (above, left).

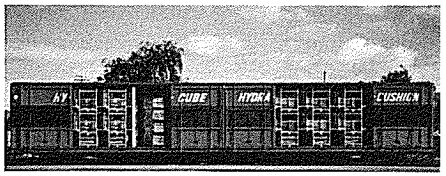
SP highway subsidiaries handle more small shipments and deliver to more Western communities than any other truck line. This pick-up and delivery truck (top, right) runs on propane gas to cut down on exhaust emissions.

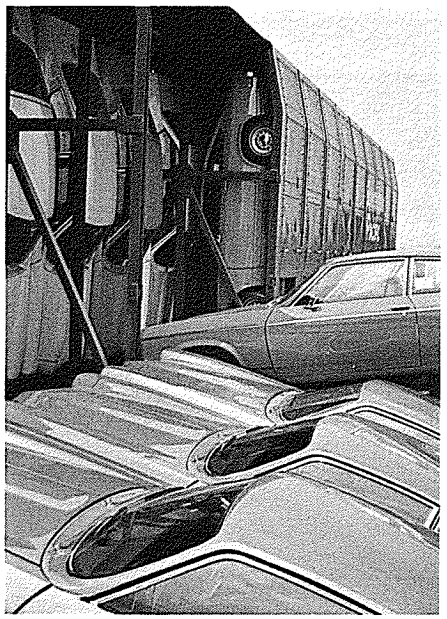
Large loads, like the huge, 455-ton atomic reactor shell (below) are a specialty of the railroad that knows how.

Pacific Fruit Express' bright orange mechanical refrigerator cars (opposite page) are familiar sights in San Joaquin valley vineyards.



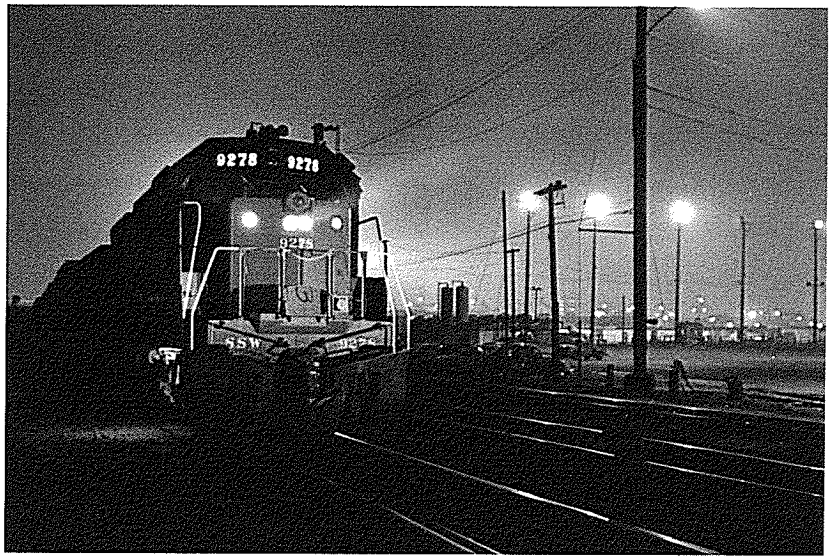






When engineers from General Motors Technical Center came to Southern Pacific to see how automobiles could be shipped more efficiently and with greater protection, SP research teams came up with two solutions. The "Stac-Pac" system (in two pictures above) is used to ship three full-size autos, one above the other, in 20-foot containers loaded four to a flatcar. More than 8,000 Cadillacs traveled in Stac-Pac shipments without damage from weather, dirt, vandalism or pilferage. The "Vert-a-Pac" car (right) is another SP innovation that carries 30 compact autos, like the Vegas shown, fully enclosed by hanging them nose down from side walls which double as ramps. More than 400 Vert-a-Pac cars are now in service. Other SP developments to expedite auto traffic include mammoth "Hy-Cube" box cars (right center) which provide 10,000 cubic feet of cushioned load space for bulky auto parts, and operation of full unit trains of autos and parts on fast transcontinental schedules.

The *Blue Streak Merchandise* (opposite page) rolls into SP's Los Angeles transportation center after run from East St. Louis that averaged 49 m.p.h., including all stops en route.



The Innovative Railroad: Southern Pacific's Operating Ideas Go to Work in Colton Yard

Steel wheels on steel rails are why railroads are basically efficient. Each wheel of a loaded freight car, bearing a weight of up to 20 tons, rides on a smooth surface the size of a dime.

This minimum friction means locomotives pull loads with a smaller expenditure of fuel and energy than other vehicles —one reason why railroads offer positive advantages in protecting the environment.

Their inherent efficiency also makes railroads our prime movers of cross-country freight and, particularly when large volumes and heavy tonnages are involved, the low-cost ones as well. Each year, railroads move about 3,800 tons of goods one mile for each man, woman and child in the United States—more than all trucks, airplanes and barges combined. By 1980, it's estimated, our railroads will be moving 4,700 ton miles or more per person.

Transportation is a highly competitive field, and to meet this challenge, the railroads must offer more than fuel efficiency. To do the whole job, they have to be efficient everywhere, from loading techniques and terminal design to signaling and paperwork.

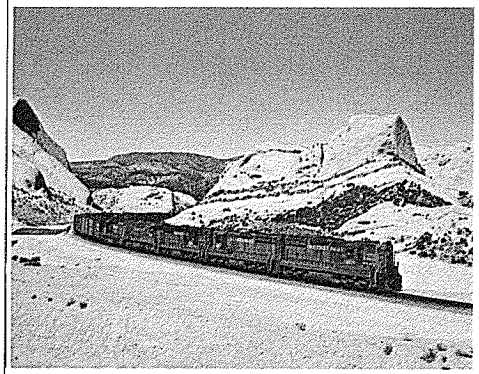
The symbol of today's railroad efficiency, operating in top form, would be a heavily-loaded, high-powered freight train, moving a long distance at express speeds, with a minimum of delay at terminals or along the route and a maximum of dependable performance for customers.

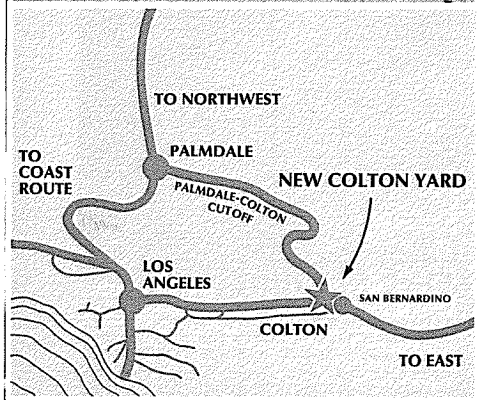
Such a train is Southern Pacific's *Blue Streak Merchandise,* for 40 years a "hotshot" train with a fine reputation among shippers and one of America's fastest transcontinental freights. Every night at 10, the BSM pulls out of the Cotton Belt's East St. Louis, Illinois, yard with 80 or 90 cars of valuable, time-sensitive cargo. In 50 hours and 30 minutes, the BSM travels 2,452 miles to Los Angeles, often hitting 70 m.p.h. and averaging 49, including all stops along the way to add new cars, change crews, refuel, and make safety inspections. Often a second section runs right behind.

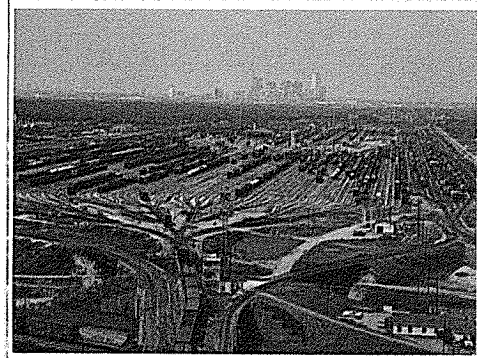
Innovations in service, many pioneered by Southern Pacific, are producing a quiet revolution in railroading today. Except for its long history of precision performance, the BSM isn't that unusual any more among SP's scores of fast trains on long runs. And the new operating concepts are being backed up by research and huge investments in new technology to improve the basic tools of railroading.

Southern Pacific is the innovative railroad. Its operations, close observers of the industry have said, represent the "advanced state of the art" as it is practiced today. And SP is advancing the art even more with:

- Frequent additions to its fleet of 87,000 freight cars. In the past 10 years, more than 45,000 new cars, costing $839 million, have been put in service.







• Versatile, more powerful locomotives. Some 1,461 new units, costing $382 million, joined SP's roster of motive power in the past 10 years, giving it a total of 2,400 units generating more than 5.5 million horsepower.

• Big, new and improved freight classification yards, automated with computers and strategically located to speed the flow of traffic.

• Smooth, fast track and good roadbed, with new lines which by-pass congested urban areas, shorten mileage and reduce grades and curves.

• Signal systems, centralized traffic control, and passing track layouts which keep trains moving on time.

• A weatherproof microwave communications system that ties all parts of the railroad together.

• The nation's outstanding railroad data system, TOPS, which keeps track of the whole railroad through computers and microwave, simplifies record-keeping and provides accurate and timely information to help management plan and monitor operations.

• Maintenance and repair systems and facilities which get track work done quickly, under traffic, and keep cars and locomotives out on the road moving freight.

Southern Pacific combined some of these elements and its long-range planning in 1967, when it completed construction of the $22 million Palmdale-Colton Cutoff, a new 78-mile line through Southern California's Cajon Pass. By skirting the heavily urbanized Los Angeles basin (see picture and map at left), it offered a 46-mile shortcut for trains moving between SP's southern transcontinental line and its San Joaquin Valley route to the central and northern areas of California and the Pacific Northwest.

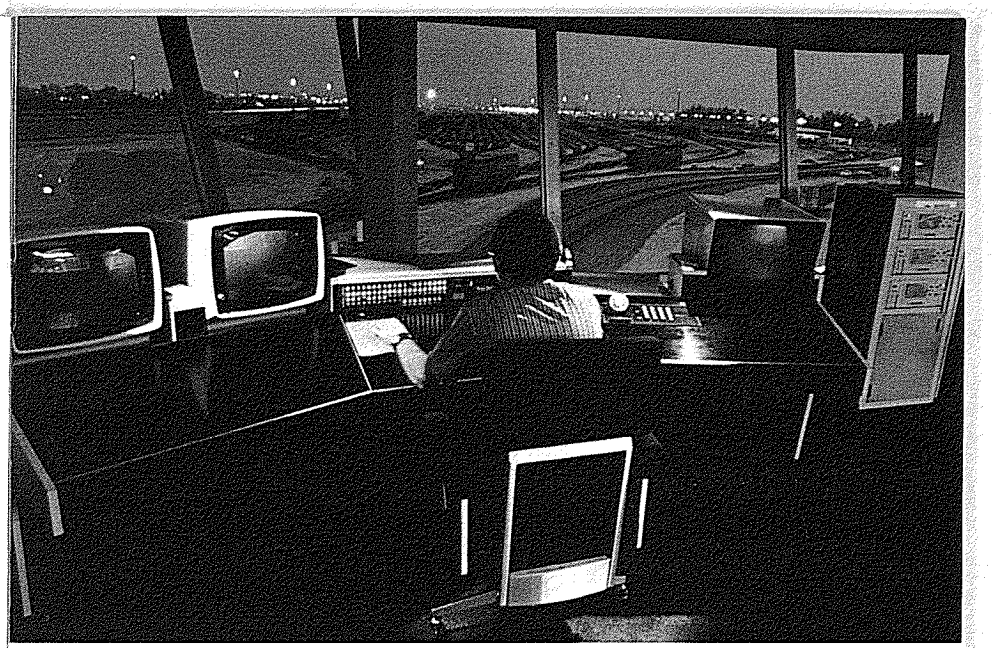
The longest new rail construction undertaken by any U.S. railroad in a quarter-century, the cutoff was completed in just 15 months, six months ahead of schedule. Thanks to SP-developed track-laying and construction equipment, sometimes looking like machines out of science fiction, the entire 78 miles of main line and 12 miles of siding were laid and surfaced in less than four months.

The West Colton Yard

Tomorrow's railroad is here today at West Colton, 50 miles east of downtown Los Angeles at a key location where the Sunset Route main line meets the Palmdale-Colton Cutoff. Here Southern Pacific is opening, in July, 1973, its huge $39 million freight classification yard, the largest in the Western United States and the most technologically advanced in the world. The yard will speed and simplify freight movement on SP lines throughout the West.

Advancements in rail yard technology are most apparent in West Colton's ability to classify, or make up into new trains, from six to eight cars per minute, compared to three or four in other yards. Sophisticated new computer systems help it release cars on a crest, or "hump," direct them to roll onto the appropriate one of 48 classification tracks, and brake them with automatic retarders to soft coupling speeds.

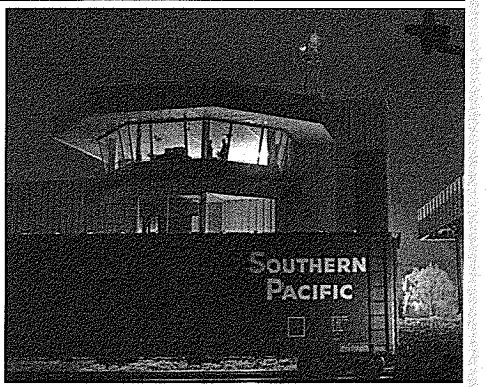
West Colton is six miles long, 2,000 feet wide, and has 93 miles of track with capacity for 6,800 cars on its 560 acres. The main classification bowl of the yard is divided into two 24-track groups, with space to add another 24 tracks when needed. The four center tracks of each group are extended to form departure tracks, so trains can move out quickly. Receiving and departure tracks are built on wide centers to permit mobilized inspection and minor repairs to cars without delay. There are large-scale facilities for repair and serv-

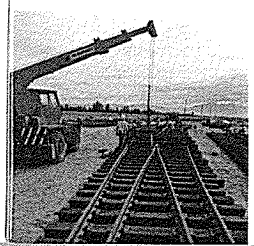


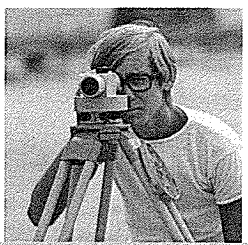
Fast freight (opposite page, top) takes Southern Pacific's "shortcut for shippers"—a new 78-mile line between Palmdale and Colton, in Southern California, completed in 1967. Its location, and that of the new West Colton yard, are indicated on the map.

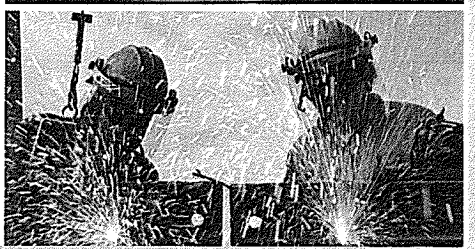
The big Englewood yard in Houston (bottom left), is one of five major automated classification yards on the SP system.

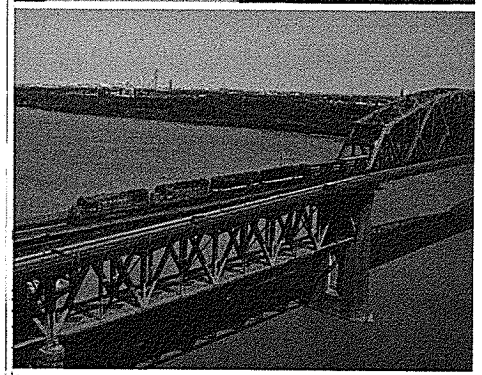
Southern Pacific's West Colton yard (this page and front cover) is the most technologically-advanced railroad terminal in the world. Control tower views (above and right) show freight cars being classified into trains in a crest operation two to three times faster than the industry average. Computers completely control the speed and track assignment of the rolling cars. Its fast throughput rate, receiving and departure tracks two miles long, classification tracks ¾ mile long, and room for expansion give West Colton an immense capacity for business. Construction of the yard (recorded in track-laying, surveying and rail welding scenes below) took less than two years.











icing of freight cars, cabooses, and locomotives, a laboratory for quality control of fuel and lubricants, and a permanent training center for personnel.

Implicit in the yard design are controls for air and water pollution and to reduce noise levels. Landscaping helps screen the yard off from its neighbors, and offices are air-conditioned and carpeted to improve the working environment.

Electronic technology abounds. Scanning units identify car numbers and inspect equipment. Computer data systems reduce paperwork and legwork. Carmen use a control panel to charge air lines and make air brake tests before trains move out. An electronic scale at the apex of the classification crest weighs cars as they move by, and any with overweight or imbalanced loads are automatically shunted to a special track for correction.

Computers play a critical role at West Colton. Stanford Research Institute helped SP develop the crest control computer (located with a backup computer at the yard), which makes a complex and constant stream of calculations for each car as it moves down the crest, and controls switching and retarding according to the car's rolling qualities.

The terminal control computer is a large unit which interfaces—or "talks" to—both SP's TOPS computer system and the crest control unit. It helps plan the flow of traffic through the yard by scanning advance consists of trains heading for Colton, and it keeps a complete inventory of all cars, locomotives and cabooses in the terminal's responsibility area, including the tracks serving industries for miles around.

Beginning early in 1974, this terminal control system will advise yard management periodically of available traffic en route and on hand for all outboard schedules, including local switching assignments for industrial service starting from the yard. If its traffic is arriving early, a train's call time may be advanced. The computer, taking into account the availability of engines and crews, will follow built-in design criteria to assign cars to blocks and blocks to trains, and to issue train make-up instructions. While the terminal computer is itself in San Francisco, people at Colton will have direct, two-way access to it through 32 cathode ray tubes, looking like television screens, and 20 printers and teletypes.

Both the terminal and crest control systems were designed for easy adaptability to other yards.

West Colton is just the latest of many Southern Pacific improvements to get trains through terminals in a fraction of the time once taken. Its other major automatic yards—in Houston, Eugene, Los Angeles and Roseville—all were models of the industry when they opened, and they've been improved with new technical wrinkles since.

For many years, SP has cut delays en route by "preblocking" most of its freight cars into groups moving together to common destinations. Often these blocks are planned so

Centralized traffic control enables a train dispatcher (top) to set signals and switches, sometimes hundreds of miles away, so trains often can pass each other on single-track line without stopping.

"Run-through" train, using pooled locomotives of Southern Pacific, Cotton Belt and Southern Railway, crosses Mississippi River on the Huey Long Bridge at New Orleans. It saves time to turn intact trains over to connecting railroads with only a crew change.

Major locomotive maintenance takes place at well-equipped shops like Sacramento. As SP frequently requires its through locomotives to run 2,000 miles through all kinds of conditions on guaranteed schedules as short as 43 hours, good maintenance is a must.

connecting railroads can run them hundreds of miles on their lines without further switching.

"Run-through" trains are prize timesavers which take this idea a step farther. SP operates about 50 run-throughs a day in cooperation with other lines at six major interchange gateways. New crews go on when the train changes railroads, but the train stays intact. Pooling of locomotives and cabooses cuts lost time at interchanges, and some transcontinental runs have saved two days. It isn't uncommon now to see SP locomotives in Indiana or Alabama.

Two big sections of centralized traffic control, totaling 590 miles, are being installed in Texas. When this $22 million project is completed in 1974, Southern Pacific main lines from Portland to East St. Louis will be virtually all double-track or CTC. CTC increases capacity of single track by giving dispatchers direct control over distant train movements. The new CTC will be computer-assisted and will give SP a total of 3,424 miles of CTC on its system lines.

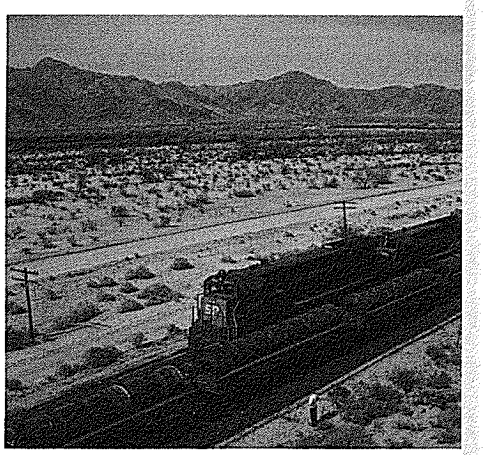
New track helps. Longer sidings are being built, and continuous welded rail, usually in lengths over a quarter-mile long, is replacing 39-foot jointed rails—taking the "click" out makes the ride smoother and maintenance easier. SP has over 4,000 miles of welded rail.

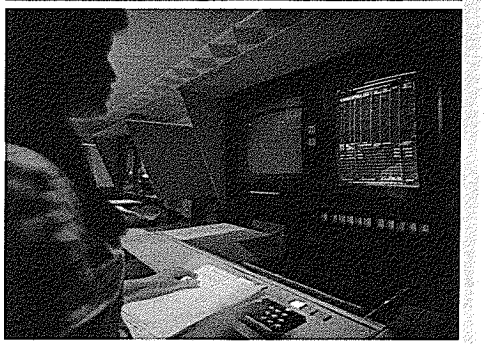
Electronic surveillance is being used to improve safety. Southern Pacific has more than 350 hot box detectors at work. These infrared heat sensors, usually located 30 or 35 miles apart on main routes, help trainmen find overheated wheel bearings before accidents occur. Newer ones will be tied into CTC systems, so warning lights will be flashed to the dispatcher as well. Other detectors spot loose wheels or dragging equipment, and ultrasonic units are used to check car axles and rail for hidden defects.

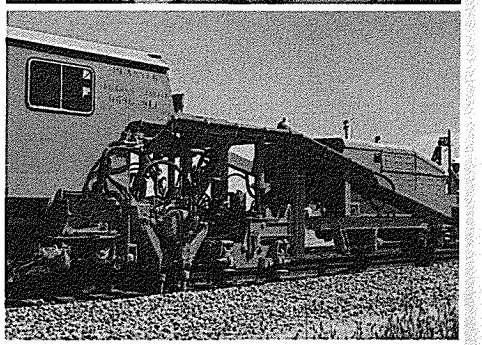
An adaptation of rocket circuitry testing used in the space program helps SP mechanical forces check out the entire complex electrical system of a locomotive in just over an hour. The electronic "SEARCH" units run a fast sequence of tests pre-programmed on tape to find trouble spots.

SP signal engineers invented the "grade crossing predictor," a compact computer that measures oncoming train speed to make sure crossing gates descend in ample time to protect road traffic without delaying it unnecessarily. SP in recent years has been installing about a third of all automatic crossing gates in the nation.

Southern Pacific research engineers always have ongoing projects. They now are leading an industry-wide study of train-track dynamics, covering all of the interacting forces that influence the motion of trains. And they are also investigating the potential of such things as automatic uncoupling of freight cars in classification yards, use of vibratory techniques to inspect roller bearings, and a retractible portal curtain to improve locomotive performance in tunnels.



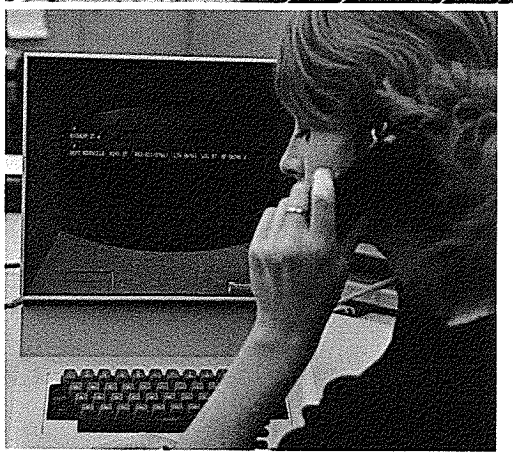




Unit train (top)—with 50 cars of coiled steel from a West Coast mill destined for automobile factories in the Midwest—is checked out by brakeman as it passes train in siding near Gila Bend, Arizona. Steel coils ride in heavy-duty cars designed by SP.

The nation's first commercial Videofile system (center) was put into service by Southern Pacific, to record more than 400,000 waybills a month on videotape. In a form of "instant replay," operator can retrieve any of them, as hard-copy printouts, in seconds.

Modern maintenance machinery, like this unit which aligns track and tamps down crossties in one operation, handle big track jobs without requiring the hard physical labor of earlier days.



"Your shipment is just outside of Reno, sir, and the train is right on schedule."

A customer in San Jose (or Chicago, or anywhere else) wanting to know how his shipment is progressing need only telephone his local Southern Pacific traffic office. The question is immediately flashed over SP's communications network to its central TOPS computer in San Francisco, and in about 3½ seconds a traffic representative, like the young lady at left, will have a precise, "eyewitness" status report to give the customer. In this case, the TOPS message indicates the shipment is on the train running alongside the Truckee River in Nevada (above).

Information is put into the TOPS system from 475 field units like those in the Warm Springs yard office in Fremont, California (opposite page, top) which are in direct two-way contact with the central computers in San Francisco. Fourth generation SP computers include one (below) used for a management information system.

Advanced TOPS Data System Opens Way to New Services

When Southern Pacific set out to develop a real-time computer system to help it plan and control its 12-state railroad operations, it decided to go the whole way and produce a complete data system that would encompass its entire operation and not just be a car-tracing service.

The result of that 1960 decision was TOPS—Southern Pacific's Total Operations Processing System. SP had to wait for some benefits it might have achieved earlier with simpler, narrow-purpose systems. But when TOPS began working in 1968, SP managers could view the wide horizons of the whole railroad, much as model train buffs oversee basement layouts.

TOPS, in fact, became the company's greatest non-human tool for making sure customers get the kind of service they expect, the railroad is operated efficiently, and management is so well informed by "real time" reports it is able to take action quickly when changes are indicated.

TOPS reports current information on as many as 120,000 freight cars which might be on SP lines at a given time—in one of perhaps 850 trains or 200 rail yards, or spotted among more than 130,000 industry service tracks. It knows about shipments in each car, crews on each train, where empty cars are, and where they are wanted. It streamlines accounting, produces useful sales and management reports, and helps terminal superintendents plan work by telling them what traffic is coming, and just where it is on the train.

Transportation schedulers use TOPS to match up cars at intermediate points with through trains, a typical one being the MSE (Merchandise Special East), an expedited piggyback freight that leaves Los Angeles each day on a 2,452-mile run to East St. Louis. Planned pick-ups of cars are modified, so the MSE sweeps up all available traffic as it goes, until—after setting out blocks at El Paso and splitting at San Antonio to form another train to Houston—it's running as a solid East St. Louis train.

TOPS performs more than 300 functions, and its users keep finding other things for it to do. Teams of experienced SP operating and computer specialists have programmed literally 10,000 changes into the system since cut-over day.

Original plans, for instance, didn't call for keeping tabs of locomotive maintenance, but all power change points now know what servicing is needed on engines coming their way and plan in advance to get much faster turn-around time for diesel units. Terminal management programs were added, to help streamline switch engine assignments and identify costs and bottlenecks.

TOPS initially cost $22 million, but has more than paid for itself. Savings in equipment utilization alone exceed $5 million a year. Before TOPS, for each box car SP was loading on a given day, it had 18 cars, loaded or empty, somewhere in the "pipeline" on its railroad. Today, the usual ratio is 14 to 1, and on many days it's as low as 11 to 1. Shipments are reaching destination and empty cars are heading back to the loading dock faster than ever.

Marketing TOPS, Here and Abroad

As TOPS spins on, there's spin-off, too. When it was decided in 1969 to find ways to market this proven Southern Pacific experience and research, **TOPS On-Line Services, Inc.** was formed as a subsidiary and given a multiple assignment. It would offer basic TOPS programs to other U.S. railroads at nominal cost, to help improve overall industry performance and promote compatibility of computer systems. As direct help to railroads or other organizations, it would design, install and even operate such systems, and train customer personnel. And it would be a vehicle by which Southern Pacific people could perform other consulting services for which they are particularly qualified.

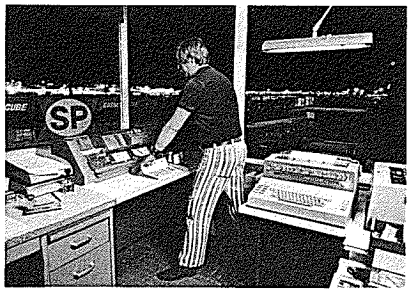
All of these activities are under way, and some of SP's bright people are working on TOPS and other advanced management programs in far away places these days.

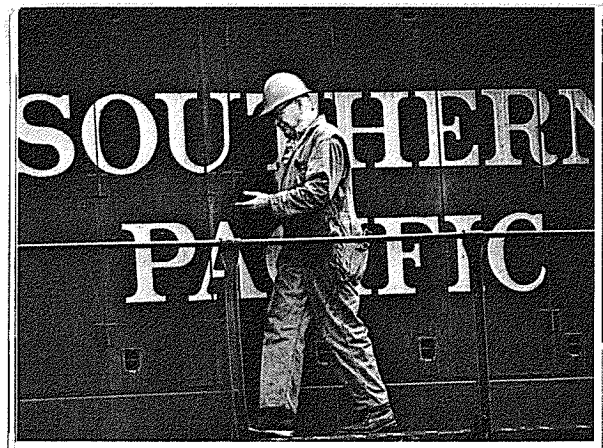
The British Railways, for example, are installing a $24 million TOPS network to keep track of business moving over that nation's 12,000 miles of railroad. TOPS On-Line teams have been in England helping with installation, and schooling British Rail people in procedures.

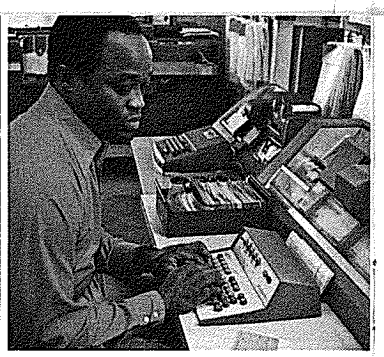
The Canadian National Railways is using TOPS programs and the assistance of TOPS On-Line personnel in building its system. Other SP people are in Mexico, producing several studies commissioned by the National Railways there.

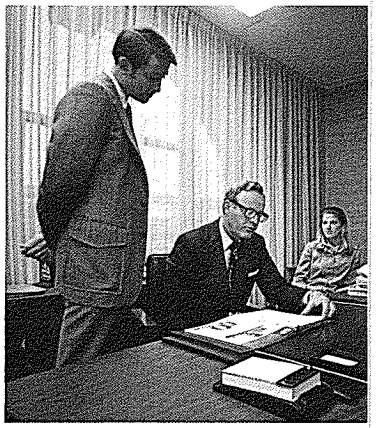
TOPS is at work on U.S. railroads, too, although sometimes under a different name. The Burlington Northern, Union Pacific and Missouri Pacific all have TOPS or an adaptation of it.

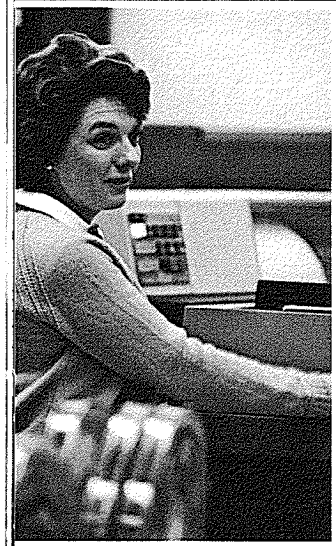
TOPS On-Line groups also have been working on projects for the U.S. Department of Transportation and the Alaskan Railways, and they developed and are running a real-time system for a major American leasing company to handle information on thousands of lease transactions.

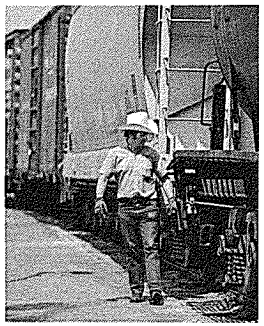


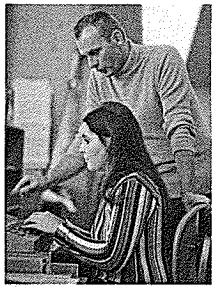


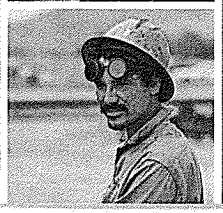


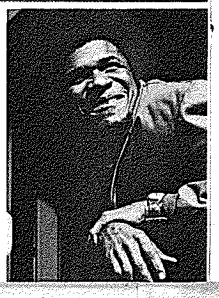


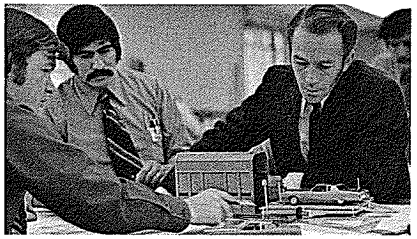












Opportunities for People: Its Good Citizens and Versatile Workers Are Southern Pacific's Most Important Strengths

Today the average wages paid an individual during his working life may exceed a half-million dollars. A prudent company devotes a great deal of care and managerial attention to investments of this size.

Southern Pacific knows its investments in people are the most significant ones it makes. And it recognizes the reverse side of the coin—that, for an individual, the decisions of what job to take, where to seek a career, are critical ones affecting one's entire life.

It hopes the 50,000 men and women who work for Southern Pacific and its subsidiaries will generally agree that they have chosen a good place to work.

The railroad traditionally has paid well, offered stable, secure employment, and provided a broad range of fringe benefits, all important incentives for job-seekers.

But there is more than that. The 5,000 persons hired by the diversified Southern Pacific family of companies last year —out of some 20,000 interviewed—represented a diverse group of talents and interests. Recent high school graduates and Ph.D.s were attracted by the great variety of career openings, broad and equal opportunities for advancement, and the prospect for future growth through continuing, company-provided training and education programs (outlined on the next page).

Southern Pacific feels it is an organization with great resources for developing the capacities of creative and energetic individuals. It is a company which is doing important work in our society, and its goal is to create a work environment in which everyone, even a person with the most specialized assignment, can sense social and economic usefulness and find personal satisfaction in his accomplishments.

Equal opportunity in hiring, promotion and training on the basis of individual merit is a firm commitment of Southern Pacific's.

Southern Pacific has been an important employer of minorities for a century. Although in earlier years minority workers were concentrated in a few basic job areas—such as on track maintenance crews or in passenger train service —today they occupy key positions throughout the company. In fact, as passenger traffic dwindled and automatic machinery replaced the hard physical labor of the section gang, SP retrained many of these employes for a wide variety of jobs standing directly on promotion ladders.

Today minority workers make up 23% of Southern Pacific's total work force.

An Affirmative Action program Southern Pacific adopted early in 1972 is specifically aimed at advancement of women and minority members in all job categories. They are being considered for any job which interests them, and are being evaluated on their individual qualifications and capabilities. In the near future, we may see women locomotive engineers, or a "trainms." fulfilling a trainmaster's assignment supervising railroad operations over an entire district.

Most Southern Pacific people are concerned and intelligent citizens who work hard, own homes, vote, pay taxes and complain about them, and worry about inflation and pollution and the future of their children.

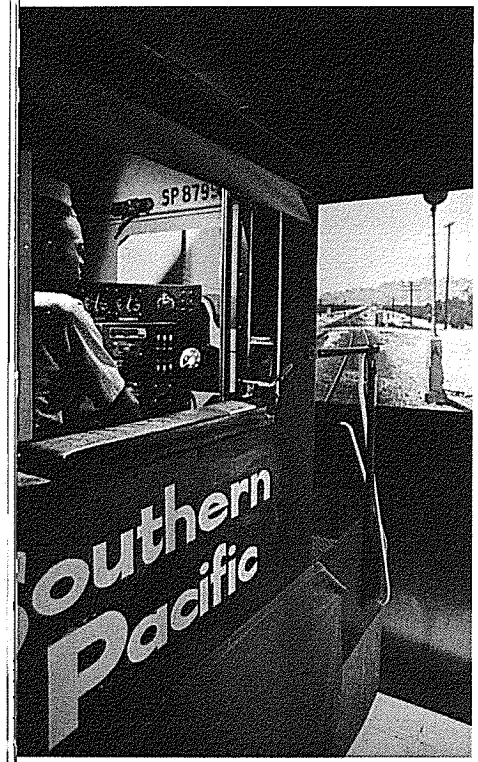
Thousands enter personally into the activities that make their communities better places to live. They are school board members, mayors and city councilmen, state legislators, volunteers in youth groups, and leaders of churches, service clubs and charity drives.

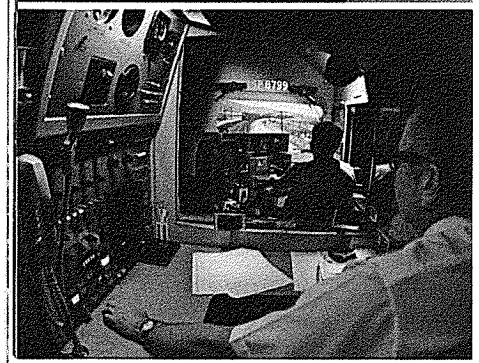
United community fund campaigns have enjoyed immense support from SP people, whose drives frequently are first in their area to go over the top in quotas. The company enthusiastically backs up these programs, offering payroll deduction plans, facilities and manpower, such as loaned executives, and sponsoring rallies and victory dinners.

Community funds also are beneficiaries of contributions from the Southern Pacific Foundation, formed in 1960 and solely supported by Southern Pacific Company through gifts of cash, property, and securities. The Foundation has given more than $5 million to private colleges, united funds and community hospital construction.

Junior Achievement is another project in which SP and its employes interact for the common good. In J.A., high school students gain business experience by organizing and operating their own small companies. With over 100 SP people acting as advisers, this year 26 J.A. firms in 14 communities operated under SP sponorship, and eight Junior Achievement centers received SP's financial support.

Protecting its future investment in the people it *will* employ, Southern Pacific also works with schools and other agencies to improve academic and vocational programs.





Training Programs Reach 7,600 Southern Pacific People A Year

Since mid-1970, more than 400 locomotive firemen have "driven" a unique and realistic train simulator, through a variety of conditions and emergency situations, as part of a 144-hour course at Southern Pacific's Engine Service Training Center in Cerritos, Calif., near Los Angeles. The $1 million simulator reproduces the experience so accurately that trainees often wave back at people on the film. Nearly all are now working as locomotive engineers.

Training isn't confined to the Cerritos center. Before new firemen get to the advanced simulator work, they are given basic detailed instruction on their divisions. Nor does training end with promotion; 3,400 of SP's experienced engineers last year took an advanced course in train handling and sophisticated track-train dynamics.

Actually, more than 7,600 Southern Pacific people took part in comprehensive in-company training programs in 1972. New courses being set up will enroll even more. SP's various subsidiaries also have their own training programs.

Entering employes—switchmen, brakemen, carmen, data processing and sales personnel, and others—get a combination of classroom instruction with on-the-job training in basic skills. Refresher sessions update experienced people in new developments and help prepare them for advancement. The Signal Department alone has seven instructors who give assistant signalmen each 320 hours of classroom work over a two-year period to prepare them for advancement to signalmen. More than 200 Southern Pacific police officers have completed a 200-hour college-level course in police science since the program began in 1971. Some 125 maintenance of way employes have combined three weeks of classroom work with six months of directed field experience in the past two years to qualify as track foremen. Five different technical courses are offered in computer programming. There are workshops in transportation management and salesmanship, effective reading, and supervisory techniques, a systemwide rules instruction program, many safety classes and films, and an outstanding 38-lesson correspondence course in freight rates.

There are intensive, formal Management Development and Sales Training programs, for which recent college graduates, many with advanced degrees, are recruited from both inside and outside the company. SP enrolls many of its people in advanced or middle management development programs, ranging from 4 to 17 weeks, at major universities.

Southern Pacific also has reimbursed over 500 full-time employes for tuition and fees of college courses, taken on their own time, which earned credit toward a degree or were directly related to their job assignment. And a small number of career employes are sent to college full time for a year or more, with expenses and salaries paid, to complete work toward bachelor's or master's degrees.

Southern Pacific's simulator gives would-be engineers realistic training with full-scale locomotive cab, sound and motion effects, and actual routes projected on a 22-foot screen. An instructor (below) uses a computer to create an emergency situation.

Summary of the Annual Meeting of Stockholders

To The Stockholders of Southern Pacific Company

The Annual Meeting of Stockholders was held on Wednesday, May 16, 1973, at the office of the Company in Wilmington, Delaware. Mr. B. F. Biaggini, President of the Company, presided.

There were 23,398,626 shares of the Company's capital stock, 87.71% of the total outstanding, represented by proxy or in person at the meeting. This expression of interest and confidence is appreciated by the management and directors.

Election of Directors

The following nominees were elected to serve as directors of the Company until the next Annual Meeting of Stockholders:

Stephen D. Bechtel, Jr.	Richard K. Miller
B. F. Biaggini	Michael A. Morphy
Thomas M. Evans	Henry T. Mudd
Alan C. Furth	George B. Munroe
Ellison L. Hazard	Richard S. Perkins
Kenneth L. Isaacs	William Swindells
Robert A. Magowan	

Management Proposal

Management introduced the resolution set forth in the Proxy Statement to ratify and approve the action of the Board of Directors in employing Haskins & Sells, as independent public accountants to audit the books, records and accounts of the Company and its subsidiaries for 1973. The resolution was adopted, 23,262,005 shares voting "FOR" and 45,301 shares voting "AGAINST".

Management Comments

Mr. B. F. Biaggini, President of the Company, opened his remarks to the stockholders by noting that Southern Pacific's business is expected to grow through 1973, although rising costs and a freight car shortage are shaving profits.

President Biaggini chats informally with stockholders Charles S. Wilbur (center) and N. W. Garrett (right).

Paying close attention to the proceedings are, from left, Mr. William Frisher, representing the Gilbert Brothers, Stockholder Mrs. Wilma C. Bichowsky, and Vice President W. R. Denton.

"The national economy can be expected to continue to expand throughout this year," he said, "and Southern Pacific's operations, in all the fields we serve, will continue to grow with it.

"There are, of course, some problems facing us, the greatest of which is our continued car shortage. The massive movements of grain to Russia have completely disrupted normal traffic patterns, diverting cars from their primary use and stacking them up in congested ports and terminals. While Southern Pacific is not a major grain shipper and does not share in this traffic, our freight cars are being diverted to it."

Mr. Biaggini added that the railroad still urgently needs rate relief in order to meet the pressure of rising labor and material costs. The industry has a five per cent rate increase now pending before the Interstate Commerce Commission.

Southern Pacific is moving rapidly ahead with various projects to improve its operations and increase its earnings, and Mr. Biaggini commented on some of the most important ones.

The railroad's new $39 million freight car classification yard at West Colton, California, will go into operation in mid-July, speeding traffic to and from eastern points.

Southern Pacific Pipe Lines, responding to the urgent demand for fuel, is engaged in a substantial expansion program, which includes adding booster stations and otherwise increasing capacity.

Southern Pacific land operations continue to grow. Last year they returned net income of $7 million (before taxes), a gain of 40% over the previous year. Major projects now in progress include the $26 million Pacific Design Center in Los Angeles, an $81 million office complex at the Company's San Francisco headquarters—both of these being joint ventures with other investors—and several new industrial parks to locate industries along Southern Pacific rail lines.

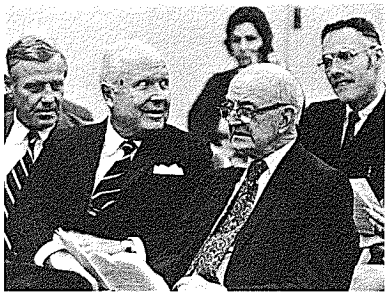
Two major centralized traffic control (CTC) installations are also underway in Texas. When they are completed, the Southern Pacific system from Portland, Oregon, to East St. Louis, Illinois, a distance of 3,500 miles, will be substantially all double track or CTC. Centralized traffic control gives an operator at a central point the ability to control train movements over long sections of rail line.

"There can be no doubt that Southern Pacific and the territory it serves are experiencing solid, substantial growth," Mr. Biaggini declared. "We can expect such growth to continue.

"For the industry as a whole, there are some problems which must be solved in order to maintain a strong national rail system. We need some progressive legislation to shore up the weaker lines, to aid in acquiring cars so urgently needed, to expedite the abandonment of unneeded and little-used branch lines, and to improve highway grade crossing protection.

"The national rail system cannot continue to exist with a few strong lines and many weak ones," Mr. Biaggini concluded. "We must exert our efforts to strengthening our system as a whole."

As the shareholders saw them (from left) Vice President and General Counsel A. C. Furth, Vice President D. K. McNear, President B. F. Biaggini, Secretary A. E. Hill and Vice President and Treasurer R. J. McLean. Behind Mr. McLean is Mr. E. E. Johnson, secretary to Mr. Hill.



Listening to a speaker from the floor are (from left) directors Richard S. Perkins and Thomas M. Evans and stockholders Rolphe E. Glover, Jr. and Martin Evoy.

Stockholders' Questions

A summary of questions and answers which seemed to be of general interest to all stockholders follows:

Mr. William Frisher, representing Messrs. John and Lewis Gilbert by proxy, asked if there had been any amendments to the by-laws of the Company since the last annual stockholders meeting. Mr. Biaggini replied that amendments had been adopted to eliminate the office of Chairman, with the retirement of Mr. D. J. Russell, and to change the number of members of the Board of Directors and Executive Committee because of retirements and deaths. In order to have flexibility in the membership of the Board, the by-laws were amended to provide that it should consist of not less than 10 nor more than 16 members. The Board now has 13 members, all of whom were elected at the Annual Meeting, and the Executive Committee consists of six members of the Board. At its meeting the next day, May 17, in view of the continuing inflationary trends, the Board increased modestly the limitations on the President's authority for approval of employment, investment expenditures and lease transactions so as to facilitate the day to day operations of the Company and its subsidiaries.

In answer to Mr. Frisher's question about the internal auditing procedures of the Company, Mr. Biaggini said that in addition to Haskins & Sells, independent public accountants, the Company has an internal auditing group which makes continuing reviews of the activities of the various departments throughout the year. This group reports to the Vice President and Controller. The independent public accountants elected by the stockholders audit the books and accounts of the Company and its subsidiaries every year and check the cash and securities twice a year. In addition, the Interstate Commerce Commission audits the accounts of the Company's transportation subsidiaries. The Board of Directors on May 17 elected an Audit Committee of the Board to review the reports of the independent public accountants and to oversee the Company's internal accounting and auditing methods and procedures.

Mr. George Levan inquired as to what could be done to alleviate the shortage of freight cars on the lines of Southern Pacific. Mr. Biaggini stated that the Board of Directors of the Association of American Railroads, of which he is a member, had authorized the assessment of a substantial monetary penalty against any railroad which failed to return freight cars to owner railroads in accordance with the AAR rules governing the interchange of cars between railroads. He expected that Southern Pacific would benefit from this action because of the large number of freight cars it owns. He also indicated that it appeared that the grain movement, which had been a major factor in impeding the normal flow of Southern Pacific's freight car fleet, had peaked and that the car supply situation should improve.

Mr. Richard Weinfield asked about the progress being made in implementing work rule changes under union agreements. Mr. Biaggini said that the unions and management were working together to improve productivity and that agreements had been reached providing for interdivisional service, thereby increasing the length of individual crew runs; for the expanded use of radios to expedite train movements and terminal handling of freight cars; and for the use of road trainmen for through train operations between connecting carriers. Previously the cars had to be brought into the terminals and rehandled to connecting carriers by terminal yard crews. He also reported that all full crew laws, requiring unneeded employees on trains, had been repealed in the states served by Southern Pacific, and unneeded firemen formerly required by agreement are being progressively eliminated. He stated that negotiations with the unions were on a continuing basis and that further changes in work rules could be expected that would be beneficial both to employees and the railroads.

Mr. R. Charles Davies asked about the status of the discussions with labor unions that have contracts expiring this year. Mr. Biaggini said that with one or two exceptions all the unions which negotiate nationally have already agreed to a contract expiring the end of next year, under which the railroads would, beginning October 1, 1973, pay a portion of the Railroad Retirement tax formerly paid by the employe. In addition, there would be a 4% increase in wages on January 1, 1974. In order for these agreements to become effective, legislation amending the Railroad Retirement Act to provide for the assumption of such costs by the railroads would have to be enacted. Such legislation is now before the Congress.

An exchange of business cards takes place between stockholder Norman L. Davidson (right) and President O. G. Linde, Southern Pacific Land Company.

Stockholders John N. Lukens (left) and R. Charles Davies, both of Lansdowne, Pa., listen intently to President Biaggini.

Directors and Officers Present

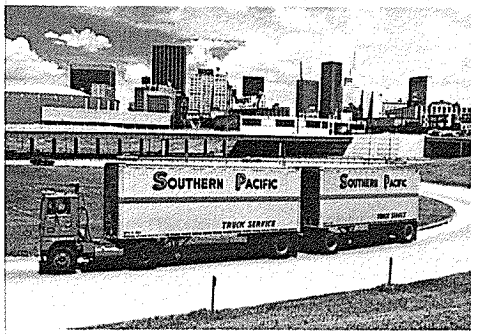
In addition to Mr. B. F. Biaggini, the following directors and officers of the Company and its subsidiaries were in attendance:

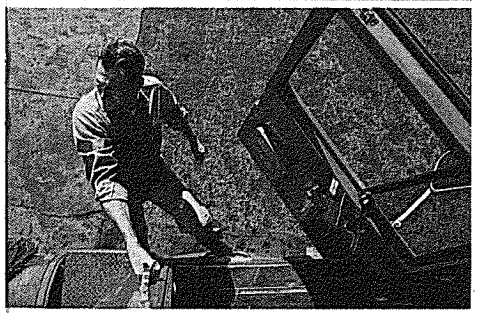
Directors: Thomas M. Evans; Kenneth L. Isaacs; Richard K. Miller; Richard S. Perkins; and Alan C. Furth, Vice President and General Counsel. Officers: W. R. Denton, Vice President (Washington, D.C.); D. K. McNear, Vice President; H. A. Nelson, Vice President and Controller; Robert J. McLean, Vice President and Treasurer; J. G. Shea, Vice President-Public Relations; H. A. Waterman, Senior General Attorney; A. E. Hill, Secretary; A. W. Faaet, District Traffic Representative (Philadelphia); H. J. Heim, Transfer Agent; and O. G. Linde, President, Southern Pacific Land Company.

Mr. R. D. Tipton, a partner of Haskins & Sells, independent certified public accountants for the Company and its subsidiaries, was also present.

A. E. HILL
Secretary

June 18, 1973
Southern Pacific Company
One Market Street
San Francisco, California 94105





Diversified Truck Service Goes to 1,800 Communities

In the 1920s, Southern Pacific foresaw the important functions trucks were destined to perform, thanks to their efficiency for shorter hauls and smaller shipments. It formed Pacific Motor Trucking in 1929 to provide pick-up and delivery in Los Angeles for the parent railroad. The new subsidiary in 1933 moved into over-the-highway service, particularly to carry less-than-carload (LCL) traffic more suited to the flexibility of trucks than to rail cars.

SP now has three main trucking subsidiaries — **Pacific Motor Trucking Company,** serving six Western states from Portland to El Paso; **Southern Pacific Transport Company,** operating in Texas and Louisiana; and **Southwestern Transportation Company,** running north from Dallas and Shreveport to St. Louis and Memphis.

They are pretty big truck operators in their own right. PMT, SPT and SWT together operate more than 8,000 highway units over nearly 27,000 route miles in 10 states, and employ almost 5,000 persons. In 1972, they hauled 7,918,259 tons of freight and brought in gross revenues of just under $94 million. Combined, the SP highway subsidiaries would have ranked third among U. S. trucking organizations in intercity tonnage handled last year and 13th in revenues.

Their pick-up and delivery trucks provide service in 1,812 communities in the West and Southwest, blanketing the inner cities and suburbs of every major urban area in the region. They also have about 400 daily "peddle run" assignments, each serving several small towns and outlying areas—some with names like Modoc Point, Iota, Fields Landing, Saspamco and Goobertown. Often they provide the only small-shipment freight service available there.

To handle thousands of less-than-truckload (LTL) shipments efficiently, the three companies emphasize easy access and advanced design of their 109 terminals. The larger ones use "towveyors"—a system of carts automatically wheeling around the loading dock to simplify distribution and handling of freight. PMT's super Los Angeles terminal, completed in 1968, has a double towveyor installation and dock space for 183 trucks and 13 rail cars.

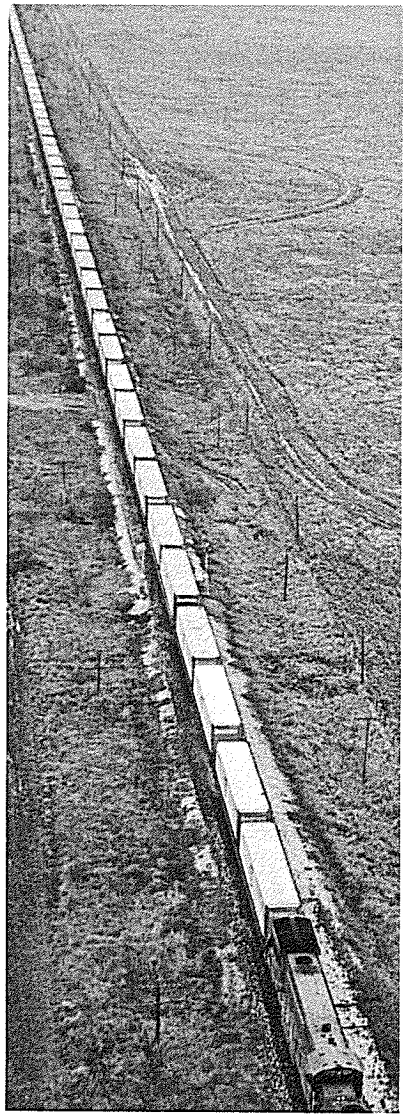
Over large parts of their territories, PMT, SPT and SWT provide total truck service, under truck rates and billing. Interstate Commerce Commission rules, however, limit operations on many routes to local or rail-supplementary service. These rules are under review, and the truck lines hope that they will one day compete on an equal basis.

The truck lines do highway long-haul, local drayage, and utilize a diverse equipment fleet—with hopper trailers for

Southern Pacific's Intermodal Transportation Center (top) at Los Angeles has truck, piggyback and rail facilities. Pacific Motor Trucking's terminal, with loading dock space for 183 trucks, is in center of picture, with piggyback loading area beyond it.

Southern Pacific Transport Company "double header" leaves Dallas (center) on line-haul assignment. SPT is Southern Pacific's highway arm in Texas and Louisiana. Southwestern Transportation Company operates truck services in the Cotton Belt area, including Missouri, Arkansas and Texas, and to Memphis and Shreveport.

Pacific Motor driver starts his day's work. PMT serves the states of Oregon, California, Nevada, Arizona, and New Mexico to El Paso.



bulk commodities, mechanically-refrigerated vans, stainless steel tankers, dump trucks, flat beds, or equipment for extra-heavy loads. They haul mail, containers for several steamship lines and cargo for several air lines. They load and deliver piggyback traffic for the railroad, and more than 9,000 railroad cars a year are spotted at PMT terminals for prompt unloading and area-wide truck distribution.

PMT also provides "truckaway" service for automobile manufacturers, delivering 275,000 new autos in 1972 to dealers through much of California.

Piggyback, Other Intermodal Services Grow with World Trade

"Intermodal" is one of the most popular words in transportation today, and intermodal traffic is one of its most rapidly growing elements.

Combinations of transportation modes produce new efficiency and whole new services. When cargoes are exchanged between trains, trucks and ships in sealed containers or trailers that do not have to be reloaded, shippers and handlers save on labor, reduce loss and damage, and speed both domestic and international traffic.

Piggyback business in the nation has grown five-fold in the past 15 years. Southern Pacific handled about 250,000 trailers and containers in 1972, and its intermodal specialists expect steady increases over the next ten years that will about double that traffic.

In 1953, Southern Pacific combined the flexibility and quick, door-to-door access of trucks with the low-cost efficiency of its railroad over longer distances. It set up the first regular piggyback schedules in the West and Southwest.

In the first full year of operation, 1954, Southern Pacific transported a modest but promising 13,544 trailers by piggyback. The business grew to 100,000 trailers by 1960 and a quarter-million by 1972, and SP now has piggyback ramps in 86 communities.

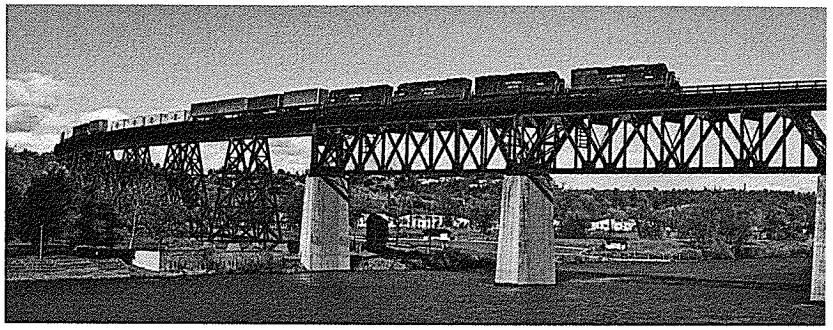
Shippers are offered a choice of plans and rates, and almost anyone's truck trailer can move in piggyback service. Trailers owned by shippers or other truck lines frequently join SP trailers on piggyback trains.

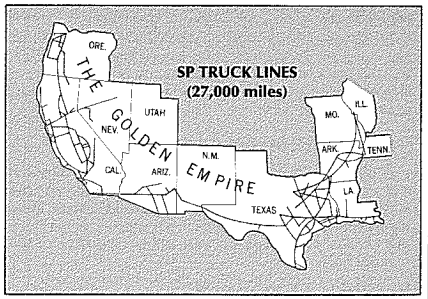
The growth of piggyback and intermodal has given rise to the transportation complex. In 1959, SP expanded its piggyback facilities in Los Angeles and built the first of three large, modern PMT terminals there. The first two terminals are now leased to other transportation firms, such as freight forwarders who use piggyback, highway and rail services.

In the early 1970's key intermodal terminals also were enlarged in Portland, Oakland, San Francisco, Phoenix, Houston, New Orleans and St. Louis, and an entirely new 19-acre intermodal center opened at Dallas.

World trade has expanded fantastically in the past decade. The containership has revolutionized marine transport and its proficiency in transloading with railroads for intermodal movements to inland points is so promising that it has revived an old dream, the "land bridge."

The railroads would be the land bridge across America for containerized freight moving between the Far East and Europe. To work, the arrangement must produce faster service for international shippers and enough savings in sailing time on the two oceans to interest steamship lines. There are problems, too, in interchanging containers, finding two-way traffic, fixing responsibility for loss, and simplifying





customs and other paperwork.

Clear back in 1869, the Big Four founders of Southern Pacific had active plans for just such an Orient-to-Europe land bridge when they opened the first transcontinental railroad. Completion of the Suez Canal the same year postponed realization of that idea, but they did unload ships from Asia directly across the old Oakland Long Wharf into the waiting cars of fast Tea and Silk Trains which hurried the high-value cargo to the East Coast.

In all except use of containers, this was what is now called a "mini-land bridge" operation: a transcontinental rail movement combined with a trip across one ocean.

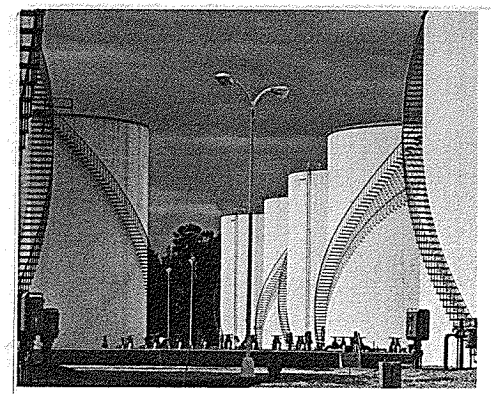
Today, most intermodal land-sea traffic similarly originates in, or is destined to, this country. It's just a beginning, but Southern Pacific has run a full train of containers from the West Coast to Gulf ports for ocean delivery to Great Britain, Scandinavia, and other parts of Europe. It carries similar traffic to and from the Far East, through Pacific ports; recently 79 containers of men's shirts, made in Korea, ran on a "mini-bridge" route, Los Angeles to New Orleans. Grapefruit, cotton and peanuts are containerized in Texas for Asia. And Southern Pacific recently carried 457 containers of complete bowling alleys, including lanes and automatic pin-setting machinery, across the country for ocean trans-shipment to Japan.

A full train of containers (opposite page) from the West Coast sprints across Texas in "mini-land bridge" service. The containers will be transloaded in Gulf port for ocean shipment to Europe.

Piggyback trains have been common sights on Southern Pacific since 1953. This one (above) crossing the Sacramento River near Redding, California, carries four containers as part of a ship-rail movement.

Giant, versatile "piggypackers" (center) were developed by Southern Pacific to reach trailers or containers quickly at any part of the train. This mobile equipment takes just 90 seconds to load or unload a 45-ton trailer. SP has eight of them at key terminals.

Large marine crane loads containers directly from a ship onto rail flatcars at the Port of Oakland, one of 36 ports of entry served by Southern Pacific, more than any other U.S. railroad.



Southern Pacific Pipe Lines Expand to Meet Energy Demands

In 1954, it became obvious to transportation planners that the growing Arizona consumer market for gasoline and petroleum products, centered around Phoenix and Tucson, was rapidly outpacing the economic capacity of railroad tank cars or tank trucks. A pipeline to deliver the needed energy fluids was inevitable. Rather than accept the traffic loss, Southern Pacific decided to build the pipeline and lose the business to itself.

Today, **Southern Pacific Pipe Lines, Inc.,** a common carrier subsidiary of Southern Pacific Company, operates about 2,750 miles of pipeline in six Western states from Texas to Oregon. During its first year of operation, SPPL handled 10 million barrels of various refined products through lines stretching east from Los Angeles and west from El Paso into Arizona. Today, its annual volume exceeds 193 million barrels, with approximately 530,000 barrels of products moving through its lines each day.

When the first lines reached Arizona, the consumer price of gasoline dropped two cents a gallon.

Initial investment in pipeline facilities is high, but their inherent efficiency in moving large volumes of liquid products gives them an advantage in holding operating costs down. This benefits both shippers and the ultimate consumers. In 1956, for example, SPPL's tariff for Los Angeles to Phoenix movements was 60¢ a barrel, about half the prevailing truck or rail rate. This is a business cost which has been reduced over the years, and the 1973 tariff is 46¢ a barrel, compared to the present truck rate of $2.43 per barrel. SPPL, as a result, handles about 90% of the petroleum products consumed in Arizona.

Pipelines were ideal additions to Southern Pacific's diversified transportation system. Most are built on railroad right-of-way property, greatly simplifying construction problems in urban areas. They are unobtrusive, largely out of sight, and create no noise, air, ground or water pollution.

The business of SPPL, like its railroad and truck counterparts, is common carrier transportation. The company owns no product but merely takes custody of refined petroleum products at refineries, marine terminals, or from other pipelines, and transports them to consuming areas where the same shipper then distributes the product to his service outlets. The average haul is about 120 miles.

SPPL also leases terminal facilities—tanks and truck loading racks—to pipeline shippers. In addition, it manages and operates the **San Diego Pipeline,** a 122-mile long products line between the Los Angeles and San Diego areas. This is owned jointly with Santa Fe Pipelines, Inc., and was built in part along the SP and Santa Fe rail rights-of-way.

The pipelines are highly-automated systems. At SPPL's Los Angeles headquarters, schedulers utilize computers and a complex communications network on a 24-hour basis to direct products movement as far away as Portland or El Paso. They monitor the flow of 65 different grades of products, each of which retains its identity as it moves through the system.

Southern Pacific's total investment in pipelines is over $164 million and recent operating revenues exceed $45 million a year.

In response to the urgent public demand for additional fuel, Southern Pacific Pipe Lines is now engaged in a substantial expansion program. Capacity is being sharply increased with new booster stations and, in some areas, parallel lines.

Black Mesa's Coal Slurry Line

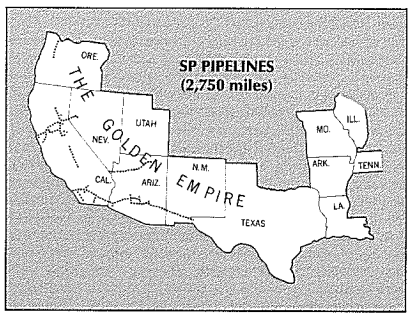
Coal is another energy source which moves by pipeline, and a subsidiary of Southern Pacific Pipe Lines operates the longest and largest coal slurry line ever built. **Black Mesa Pipeline, Inc.** has a 273-mile line that is capable of transporting 5 million tons of coal per year at flow rates of up to 660 tons per hour.

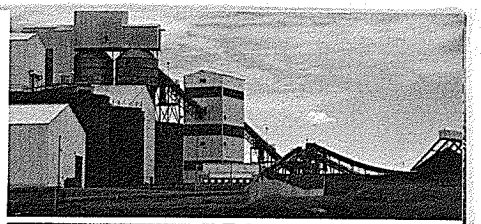
Built at a cost of $38 million, the slurry line delivers coal from Northeastern Arizona to a single customer—the big Mohave Power Project plant on the Colorado River near Davis Dam, Nevada, which generates electricity for distribution through Southern California, Arizona and Nevada.

The coal is trucked from mines on Navajo and Hopi tribal lands and turned over to Black Mesa—most of whose employes are members of those tribes—at its slurry preparation plant at Kayenta, Arizona. The coal is reduced to the consistency of a powder and mixed with water to form a slurry which is pumped through the 18-inch line at about 4 miles per hour. After a three-day trip to the generating plant, the coal is extracted from the water by centrifuges and fed into the furnaces.

It is anticipated that the line will carry at least 117 million tons of coal over a 35-year period.

Black Mesa's success with a slurry pipeline on this large scale was the result of a major research effort in which experienced pipeline personnel made major contributions. Test operations began in the summer of 1970 and commercial operation of the line started in late 1971. Industry and government representatives from many nations have shown interest in Black Mesa's operation and in possible use of its unique test loop facilities at Kayenta.





The Black Mesa Pipeline grinds and then slurries coal at its processing plant at Kayenta, Arz., and pipes it to the Mohave Power Project, 273 miles away in Nevada. The supervisor at the console controls the pipeline operation and part of the slurry preparation process.

Bankers Leasing's Billion-Dollar Business

The search for capital by American industry is endless, as its need for mammoth investment in new equipment and facilities grows greater each year. Leasing and financed purchases account for about a quarter of all equipment expenditures in the United States—a huge and growing market.

Bankers Leasing Corporation, a wholly-owned subsidiary of Southern Pacific Company acquired in 1964, plays a major role in this active business. Although the Boston-headquartered firm may not be known as widely to the general public as other firms offering small leases to individuals or businesses, Bankers is one of the nation's largest leasing companies.

Its customers are mostly major industrial and utility companies with large requirements. Its leases cover such equipment as production machinery and machine tools, fleets of trucks and passenger cars, railroad freight cars and locomotives, jet aircraft, computers and data processing equipment, printing presses, storage tanks, and store and office fixtures.

In 1968, for example, the Bankers Leasing group acquired, for lease to a utility company in southeastern Ohio, the first fully-automated electric railroad for hauling coal in non-common carrier service, the 15-mile Muskingum Electric. It also leases, for the same operation, the world's largest unit of coal-mining machinery—a dragline called the "Big Muskie," with a 220-cubic-yard bucket capable of moving 325 tons of material at a single pass.

Bankers Leasing and its subsidiaries, at the end of 1972, owned equipment originally worth $526 million, which was leased to 144 companies.

The Bankers Leasing group also acts as the marketing agent for leasing activities of several major financial firms (including Commercial Credit Company, Diebold Computer Leasing, and CNA Nuclear Leasing, which leases nuclear fuel cores to utility companies). When this substantial marketing activity is included, Bankers Leasing is responsible for over $1 billion in leased equipment.

Microwave System's Success Led To New Communications Company

Since transportation has always been Southern Pacific's business, its diversification into common-carrier communications services is no surprise. Communications, after all, is the transportation of information.

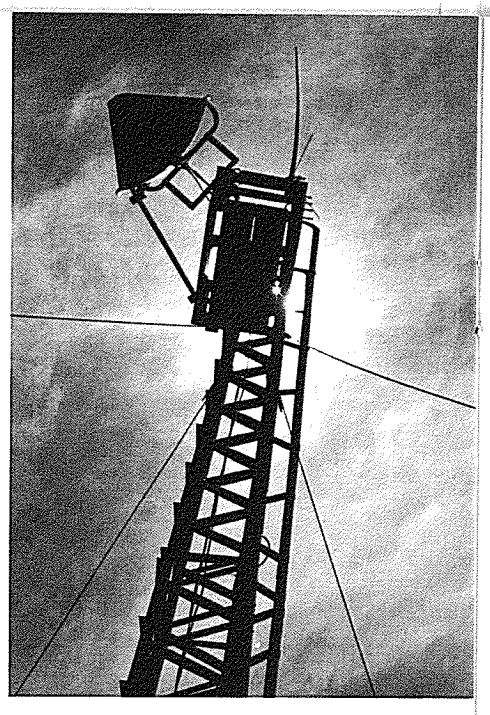
With 20 years' experience in operating the nation's largest private communications system, SP understands business communications. Its microwave radio system, with 500,000 channel miles extending over more than 6,800 route miles, operates with a proven 24-hour reliability of 99.96 percent.

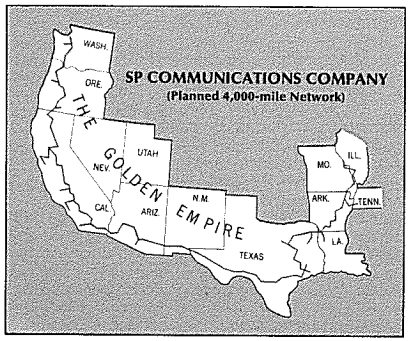
The new enterprise, **Southern Pacific Communications Company,** draws upon this experience in offering a wide range of specialized voice and data communications services to private-line customers in business, industry, education and government. Its service will be tailored to the customer's specific need—whether it's a simple teleprinter link between two points or the complex demands of a computer network covering many locations.

SPCC is going into operation in the summer of 1973 with the San Francisco-Los Angeles unit, and in 1974 with the Los Angeles to San Diego and Houston segments, of an eventual $30 million system, stretching down the Pacific Coast from Seattle, across the Southwest to Texas, and up to St. Louis, covering 4,042 route miles. Plans are to develop a complete nationwide service for SPCC customers.

SPCC sells time on these circuits, and also provides professional consulting. It conducts a thorough investigation of a user's communications needs, seeking potential dollar savings for him. Specialists are available as "outside staff" communications managers for a customer needing sophisticated engineering and experienced operation of his private-line system.

One advantage which the Communications Company has in getting a fast, sure start is that the new system to a large extent will overlay the existing Transportation Company system, using many of its 225 microwave relay station sites. Microwave has the ability to transmit a high volume of radio wave impulses by line-of-sight transmission. Towers spaced 25 to 30 miles apart beam interference-free signals across the country with a minimum of unsightly and weather-vulnerable wire lines.





The railroad's system provides a complete intercity dial telephone service—a Fresno traffic salesman can easily call Chicago, or Pine Bluff, or any of 11,000 dial phones on our lines.

The system also has hundreds of channels for facsimile transmission, telemetering, train dispatching, centralized traffic control, automatic car identification, VHF radio relay, and the high-speed data flow required to run Southern Pacific's TOPS system. Since reliability is so important in this communications traffic, SP's microwave system is fairly unusual in having a complete stand-by capacity; emergency generators, backed up by batteries, are provided at all key points.

Southern Pacific and its subsidiaries also operate about 8,500 VHF mobile radios and more than 400 radio base stations. Two-way radio is an every-day working tool for train crews and dispatchers, train inspection, yard and maintenance operations and trucking and pipeline companies. Reliable communications enable Southern Pacific Pipe Lines, for example, to dispatch and monitor fuel flow in six states from its Los Angeles headquarters.

Amtrak Runs Passenger Service; Railroad Retains Commuters

Passenger trains—whether here, in Europe, Japan or anywhere—almost always lose money. Their costs are high, their competition is immense and subsidized, and travel habits have changed.

Southern Pacific found this out after doing its expensive best, following World War II, to win customers with a $40 million fleet of new streamliners and $1 million a year advertising them. Despite low fares and heavy promotion, people deserted the luxurious new trains for the speed of the airliner and the convenience of the private auto. By 1954, SP's annual passenger deficit was a shattering $58 million.

Even after cutting costs and tailoring service to fit lower demand, SP's passenger deficit was still $18.5 million and the hard-pressed rail industry's total loss was about $500 million when Congress established Amtrak to see if there was any way a single national system could sustain itself.

Amtrak—the semi-public National Railroad Passenger Corporation—in May, 1971 took over most of the country's intercity passenger service (but not commute trains). It discontinued about half the existing trains, reorganized the rest into a unified network, and began a major promotional program. Independent of state and federal regulatory agencies, Amtrak can set its own fares and service standards, alter schedules, make its own decisions on equipment and maintenance, and experiment with new services.

Twelve U.S. railroads, including SP, paid Amtrak to join and so provided much of its original funding. Now the railroads are reimbursed for most of their passenger service expenses, but they have not been recovering all their costs.

Amtrak contracted with SP to operate trains a total of 3,998 route miles on three long-haul Amtrak routes: the *Sunset,* from New Orleans to Los Angeles; the *San Francisco Zephyr,* on the Oakland-Ogden portion of the Bay Area-Chicago run, and the *Coast Starlight,* on the Los Angeles-Portland portion of Amtrak's San Diego-Seattle route. The *Coast Daylight* provides service between Los Angeles and Oakland on days when the *Starlight* does not operate.

Many veteran SP train, dining car and ticket office personnel work on behalf of Amtrak—some, in fact, are now Amtrak employes—and independent surveys have given them high marks for friendly and efficient service.

Amtrak still is in the experimental stage, striving to meet the goals Congress established for a modern, efficient, "for profit" system. Southern Pacific will benefit from Amtrak success and has committed itself to good service and performance under its contract.

San Francisco Commute Service

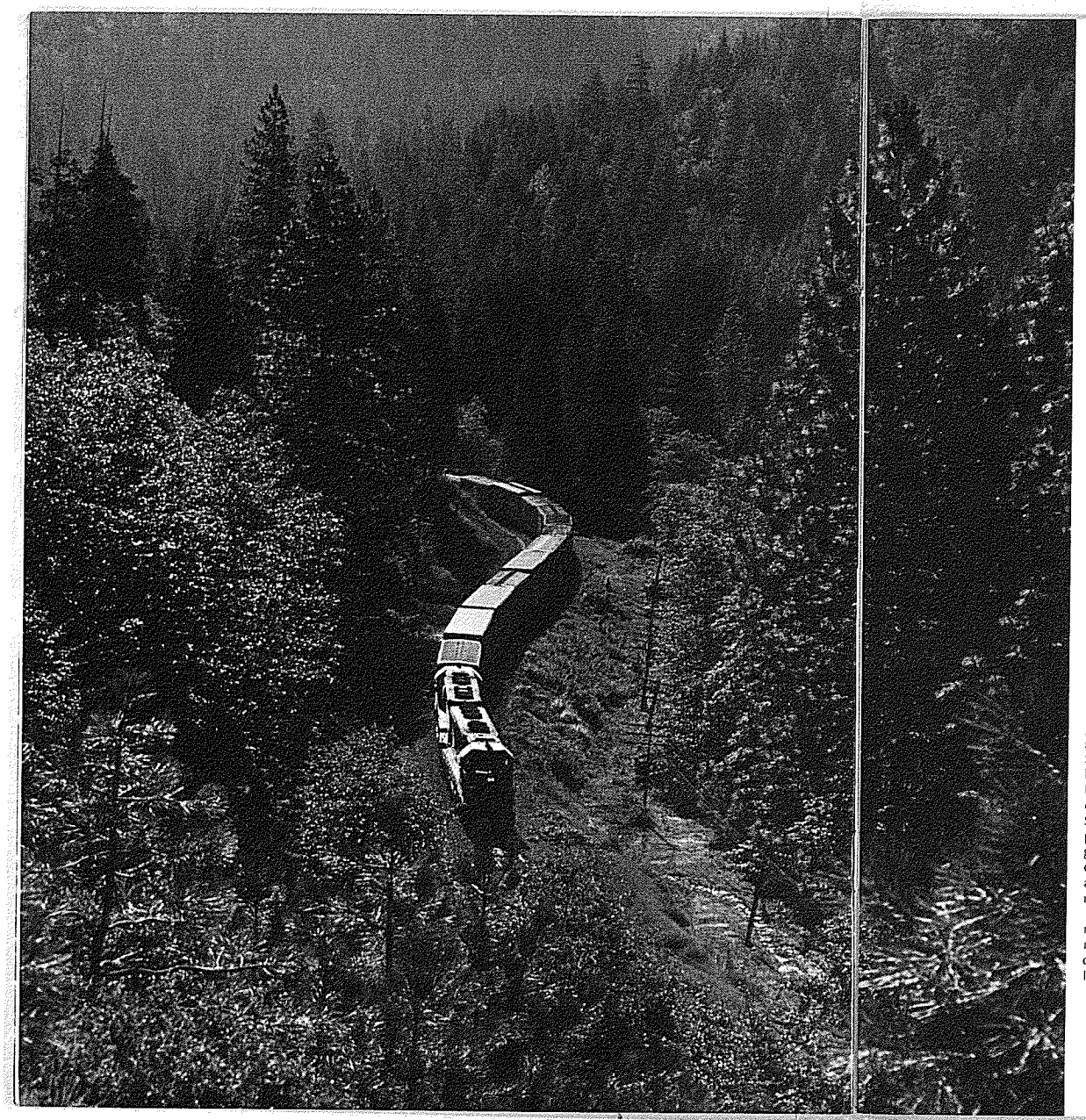
Each weekday, 11,000 commuters ride 22 Southern Pacific trains each way on the 47-mile main line between San Jose and San Francisco, where SP still has the responsibility of running commute trains. Peak commute business was in 1954, when about 16,600 commuters rode local trains on the San Francisco Peninsula—but this number dropped as new freeways opened.

Fast schedules, good on-time performance, and low fares make this service one of the nation's best. SP commute expresses run three minutes apart in the evening rush; the 5:14 from San Francisco reaches Palo Alto's California Avenue station, 32 miles away, in 38 minutes. Regular SP commuters, even under recently proposed fare increases, will pay less than commuters on Peninsula buses, Bay Area Rapid Transit, or commute railroads in other cities. A Redwood City commuter would pay $31.50 a month for his 25-mile trip, while comparable tickets at Chicago and New York range from $34 to more than $50.

About 400 persons, 23 locomotives and 100 cars are engaged in operating the commute fleet. Because the trains are only busy for a couple of hours each day, and because costs have increased (commute employe wages and benefits went up nearly twice as fast since 1965), SP's commute service has been running at a deficit of more than $3 million a year.

Future plans for the service are uncertain. At the very least, however, it is absolutely essential that the fare increases which are now being considered by the California Public Utilities Commission be granted in the near future.

Dining car steward and Amtrak representative chat with passengers on Coast Starlight dining car (above), while Southern Pacific doubledeck car unloads commuters at Palo Alto.



Southern Pacific and the Environment

The efficiency of modern diesel locomotives and steel wheels on steel rails means the railroads use less energy than other surface carriers and disturb their surroundings less than practically any other mode of transportation.

While a diesel truck can deliver 64 tons one mile on one gallon of fuel, an average train moves 238 ton miles per gallon—giving trains a fuel consumption advantage of almost 4 to 1 over trucks. And trains move 125 times as much freight per gallon as cargo aircraft.

Nor does a railroad need a vast amount of land on which to operate. Compare the small scar a rail line leaves on the landscape with that of a modern super highway: American railroads occupy only about 1/13th of the land covered by federal-aid highways alone. Railroads can handle a much larger volume of traffic on existing lines, and their taxpaying rights-of-way are available in many cases for pipe lines, power lines or communications systems as well.

Pipe lines intrude on the landscape even less. Once constructed and grown over, the underground lines leave no scar at all. Southern Pacific Lines move more than 530,000 barrels of refined petroleum products a day—in effect eliminating the highway congestion and air pollution of 2,900 tanker trucks each day. Expensive vapor-recovery systems also have been installed by SPPL at major terminals, for use of all its shippers, to cut emissions when they are loading their trucks for distribution to customers.

Other services of the diversified SP family also contribute to environmental protection. Pacific Motor Trucking has put 80 propane-gas-powered trucks into pick-up and delivery service in the Los Angeles, San Francisco and Sacramento metropolitan areas, with excellent results in reducing emissions. Pacific Fruit Express is testing closed-cycle gas-turbine engines for its mechanical refrigerator units. SP Land Company is a partner in a project to produce electric power from "clean steam" in geothermal fields it owns, and its record of conservation-minded, responsible forestry and land management practices is highly regarded.

At Southern Pacific, full-time environmental engineers and a standing environmental committee keep a close watch on developments in this area. SP is one of the leading railroads in the country in the initiation of environmental study projects, both for itself and on behalf of the entire industry.

It has sponsored research with locomotive builders, fuel companies, air pollution control districts, and other railroads to find the best ways to control engine emissions and keep the air smog-free. SP engineers are working on more accurate smoke meters, in the hope they can be perfected to the point where individual engines can be "certified" as meeting air-pollution standards or assigned to servicing so they will maintain such standards.

Southern Pacific also has commissioned a leading national research laboratory to make the first definitive studies of noise produced by railroads—on the line, in yards, in adjacent community areas—upon which workable and meaningful guidelines for noise regulation can be based. Other railroads now have joined in financing the research.

Other mundane, but important, activities include devising and installing facilities to control water pollution and handle disposable waste (including biodegradable toilets for trains); development of locomotive spark arresters (to prevent trackside fires) and nets for covering wood chip cars (to reduce wind-blown litter), and even reclamation of office waste paper for recycling (which incidentally earns SP about $2,000 a month).

SP research engineers also have taken aim at a nationwide junk problem: the disposal of abandoned automobile hulks and scrap auto tires. One possible solution under study is a "recycling train"—with mobile crusher and shredder, a non-polluting incinerator for burnable scrap, and special gondolas for economic transport of reclaimed metal and rubber.

It's a large job. In 1972, Southern Pacific spent about $6.5 million in environmental protection activities; it may well spend $55 million in the five years through 1977. The company's attitude has been summed up by President B. F. Biaggini, who also serves as chairman of the National Industrial Pollution Control Council's railroad sub-council:

"No industry, at this time in history, can undertake any endeavor without considering its effect on the air we breathe, the water we drink, and the total surroundings in which we live. Whatever decisions we make at Southern Pacific must always be made with this in mind."

Southern Pacific Land: Diverse Holdings, Managed for Highest Long-Term Potential

Southern Pacific presides over an incredible sweep of terrain—alpine wilderness and densely forested slopes, barren desert and fertile farmland, recreational beauty spots and busy urban real estate. Its management of land is predicated on the knowledge that Southern Pacific intends to be in business for a long time. It is a good neighbor in its communities, an important taxpayer, and a strong believer in sound, responsible development. It shuns speculative land games and emphasizes appropriate land use patterns.

Its experience is that conservation and careful planning for continuing long-term use of resources produce the most lasting profits.

Southern Pacific's experience in land management, in fact, goes back more than a century. It laid out towns, sold land to settlers, found markets, and helped settle the West. It opened and operated some of the area's most famous early resorts, like the historic Del Monte Hotel on California's Monterey Peninsula. From the 1920s on, SP efforts to generate more rail traffic through industrial development have helped bring an average of one new carload-producing industry per calendar day to sites along the railroad. For more than two decades, SP has gained national recognition for management of forest lands for perpetual production.

With land management techniques growing more sophisticated and pressures of growing population opening up more potential uses for land, Southern Pacific decided to broaden and accelerate its programs for effective development. In 1970, it brought several departments together in a reorganized **Southern Pacific Land Company,** made it a direct subsidiary of the parent holding company, and gave it the responsibility of managing all SP lands. The Land Company has three interacting divisions:

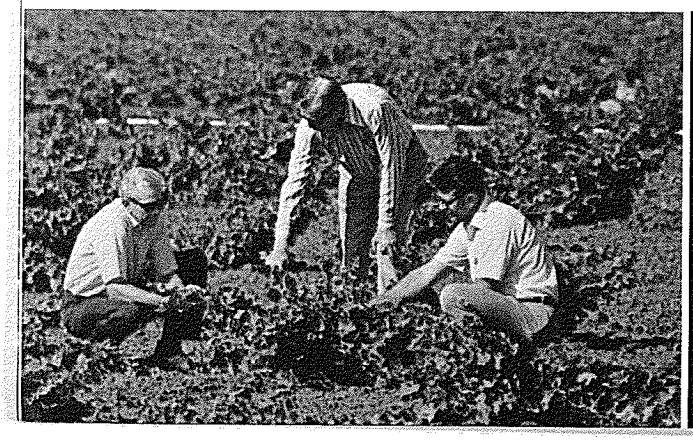
- Natural Resources manages most of SP's 3.8 million acres of "outlying" lands, as well as mineral rights on 1.3 million acres more, in California, Nevada, and Utah. The division markets timber, negotiates oil, gas, mineral, agricultural and grazing leases, and seeks quality opportunities for recreational development.
- Industrial Development works closely with local communities in setting up attractive industrial parks. SP has more than 38,000 acres of strategically located industrial properties in over 100 districts in major market areas of 12 states.
- Real Estate oversees the company's urban and right-of-way properties not needed for transportation purposes, including about 30,000 acres of good commercial land with more than 12,000 active leases.

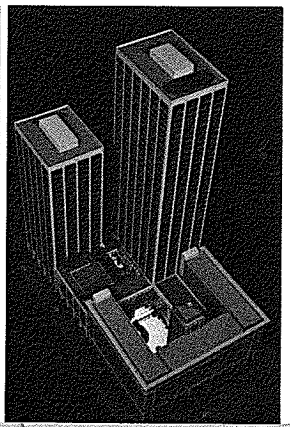
Southern Pacific Land is set up to produce and enhance long-term income through land management and investments. Also formed in 1970 were **Southern Pacific Development Company** and subsidiaries which buy and sell real estate and now have development and construction projects underway in 17 states, from shopping centers and industrial parks to hotels, apartment complexes and resorts.

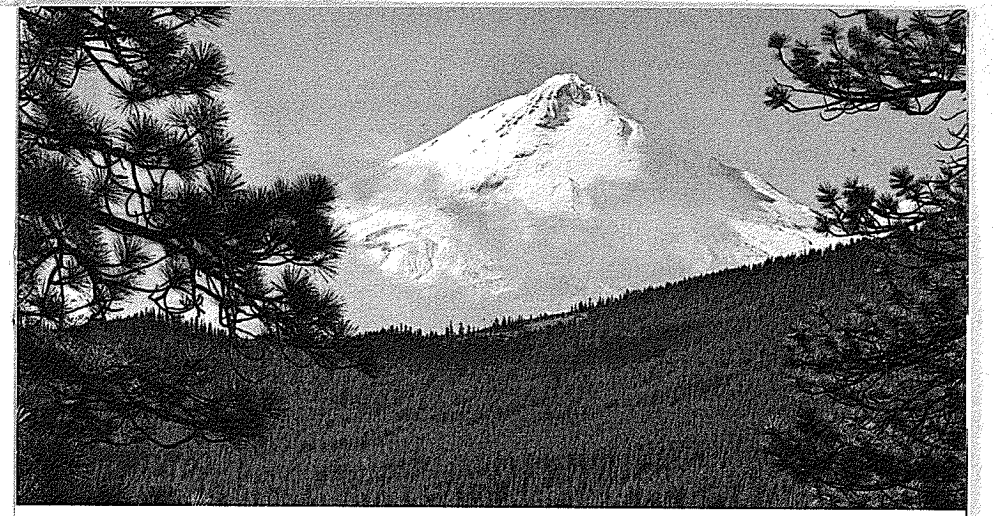
Some of this diverse activity is carried on by **Sequoia Pacific Realco,** a Santa Ana, Calif., firm of which SP Development is controlling partner. In two years, Sequoia Pacific has undertaken projects with a total volume approaching $100 million. Its activities include industrial build-to-suit programs, master planning and construction of industrial parks and commercial office, restaurant and retail space, land packaging and financing, and creation of leisure communities, mobile home parks and residential projects.

Southern Pacific Land's new Golden Vineyards subsidiary planted 2,200 acres in eight varieties of grapes (left) in 1972, as a joint venture in Fresno County. First crops are due in 1975.

One Market Plaza is an $81 million office and commercial complex, with 43 and 28 story towers, under construction adjacent to Southern Pacific's General Offices (lower right) in downtown San Francisco. The development, which was designed to protect the city's historic view corridors, is a joint venture of SP Land and the Equitable Life Assurance Society of the United States.







Scientific Forestry Programs Plan Natural Regrowth of Trees

Twenty-eight full-time Southern Pacific foresters have as a work environment some of the most beautiful and well-maintained forest lands in America.

Their business, under the stewardship of the SP Land Company's Natural Resources Division, is the long-term management of about 450,000 acres of timber in Northern California—in the Siskiyou and Trinity Mountains between Redding and Yreka and on either side of Donner Pass in the Sierra Nevada. The company adheres to a "sustained yield" program which limits harvesting of mature trees to the reproductive capacity of the forest.

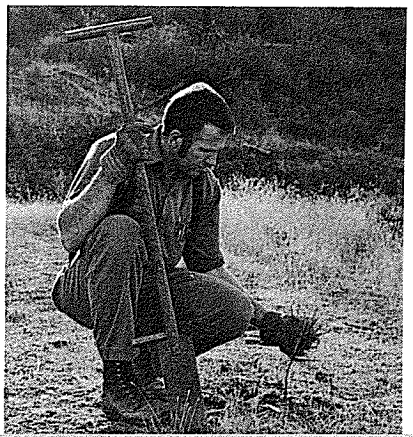
These conservation-minded professional foresters have a strong commitment to protecting the environment so the lands in their charge remain scenic as well as productive.

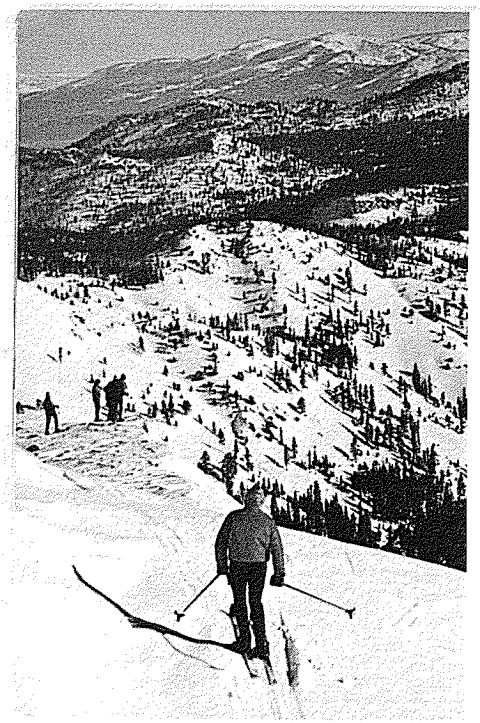
In one of the nation's best examples of responsible forestry, a program which SP began in 1951, they select for cutting only trees which have begun to show signs of disease or have reached their maximum economic growth—and therefore never cut all of a stand of mature timber, and always leave enough trees so the area will replenish itself. The selection for timber cutting is augmented by sophisticated aerial photography to inventory and analyze tree growth and species.

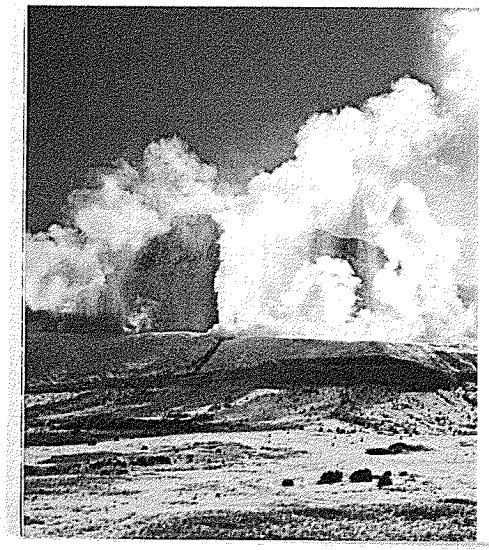
Timber produced from SP lands is sold to major wood products companies on a bid basis. SP foresters select the trees for logging contractors to cut, then monitor their operations under strict environmental guidelines to minimize habitat destruction and erosion and to prevent stream pollution and permanent scarring or litter of the landscape. Sophisticated techniques for timber removal are being used where conventional tractor methods would harm the forest environment. Where forest fires have damaged the standing timber's ability to reproduce itself naturally, SP foresters evaluate all possibilities for reforestation. With continued careful management, the forest can be harvested again and again over the years as it renews itself.

Major conservation groups and university forest scientists have commended Southern Pacific's silvicultural program and its conscientious approach to the maintenance of environmental quality.

This Southern Pacific forest land (above), near Mount Shasta in Northern California, has been previously logged, but SP's careful program of selective cutting helps the forest regrow and stay beautiful. (Below) SP forester checks growth pattern of seedlings.







Careful Land Plans Help Protect Company's Natural Resources

Energy shortages and environmental concerns have turned the world's attention to the possibility of greater development of geothermal resources. Steam from deep geothermal wells might prove to be an important, clean and attractive source for electric power, and chemicals and minerals could be extracted from the superheated brine.

Southern Pacific Land Company's Natural Resources Division late in 1972 undertook an extensive joint geothermal research and development program with Phillips Petroleum Company and Southern California Edison Company. This is centered in the Imperial Valley of Southern California, along the southeastern edge of the Salton Sea near Niland, on about 30,000 acres, part of which SP owns and the rest holds under lease agreements.

This research is aimed at perfecting methods of using geothermal heat for electric power generation and recovering such valuable minerals as manganese, copper, lead, silver, lithium, zinc and potash. Every effort is being made to design environmental protections; the brine, for example, would be reinjected into underground reservoirs and wastes would not be allowed to degrade the area.

The Imperial Valley project is the first under a 10-year agreement between Phillips and SP Land for joint exploration and development of geothermal properties throughout the United States.

This is only one of the innovative approaches to development being undertaken by the Natural Resources Division staff of professional specialists in forestry, geology, agronomy, range management and ecology.

Another is Alpine Tahoe, a 100-unit condominium planned for the base of the Ward Valley ski bowl near Lake Tahoe. The single low structure will be contoured to the slope, to minimize grading and to avoid cutting trees, with parking areas under cover and out of sight.

The ingenious use of old telegraph wire, which became surplus when SP switched to microwave communication, is yet another. It's being used to string up wine grapes in the 2,200-acre planting of the new Golden Vineyards subsidiary.

The new vineyard is the only case where SP is directly involved in farming. Its 165,000 acres of agricultural land, mostly on the west side of the San Joaquin Valley, is usually leased by farmers with adjacent acreages. Cotton, barley, melons, and sugar beets are common crops.

The 3.8 million acres supervised by Natural Resources include what remains in SP ownership of land grants made by the federal government in payment for construction of the pioneer rail lines, and for reduced rates the railroads gave government freight, mail and personnel for 75 years. Only in recent years have new methods and markets made much of this property productive. About two million acres, most interspersed with public lands in Nevada's high plateau, are leased for cattle and sheep grazing. About 600,000 acres are in desert regions of Southern California.

Although Southern Pacific looks at its lands in terms of productive use, it holds some mountain and desert areas which it thinks should be in public ownership and which it has offered to trade to the federal government. Such is the case with 53,000 untouched acres in California's Trinity Alps which SP feels should be preserved as wilderness.

6,000 New Industries Find Sites Along Railroad in Last 10 Years

Southern Pacific is in the business of serving industry—not just by moving freight, but by helping plan all the transportation logistics of its customers, from raw material to ultimate consumer. A key early element in this is the choice of plant sites.

Potential shippers often turn first to SP's experienced industrial development specialists for quick, confidential and unbiased information about hundreds of possible sites for their proposed manufacturing, processing or distributing facilities.

The SP Land Company professionals provide reliable data on land cost and ownership, taxes, freight rates, labor supply, zoning, utilities, highway patterns and rail services. They tap computer banks for economic, demographic and financial analyses of various areas, and they provide aerial photos and engineering or topographic maps of specific property. Their computer-based cost and logistics studies can prove the profitability of a particular site and, being in constant touch with local officials and planning commissions to encourage constructive zoning and balanced industrial growth, they can usually match up the right community with the right industry.

Once the decision is made, the SP industrial men may help coordinate actual site development, to the final property negotiations and spur track planning.

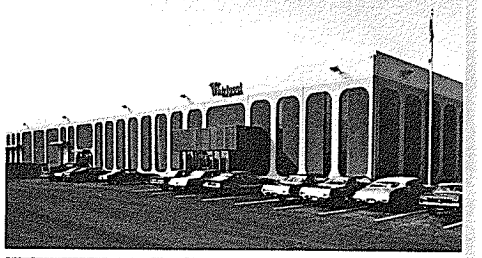
Their ability to tie together the three basic needs of industry—raw materials, manpower and markets—has accounted for much of the success of SP's industrial development programs over the years. Since 1929, Southern Pacific has averaged a net gain of more than one new rail-served industry along its lines per day.

For the communities involved, the impact has been tremendous. The nearly 6,000 industries built along the railroad over the past 10 years brought a total investment in new tax-paying business of more than $4 billion and created an estimated 218,000 jobs.

A big factor in this growth is Southern Pacific's "ready site" program. Working closely with communities and private land developers, SP Land Company helps set up attractive industrial parks, carefully zoned for environment and landscaping, with streets, utilities and rail access already installed. The customer seeking a new home town knows what he's getting.

Over several years, the company has purchased several thousand acres of good industrial property, to make sure it's there when needed. SP has more than 100 industrial parks or districts in 12 states, and works with hundreds more owned by others.

Now service to industry has been refined by one more step. Sequoia Pacific Realco, SP's new affiliate, offers an attractive, build-to-suit package. It can design the facility to meet the shipper's needs, arrange financing, supervise construction, and turn over the key to the finished plant on move-in day.



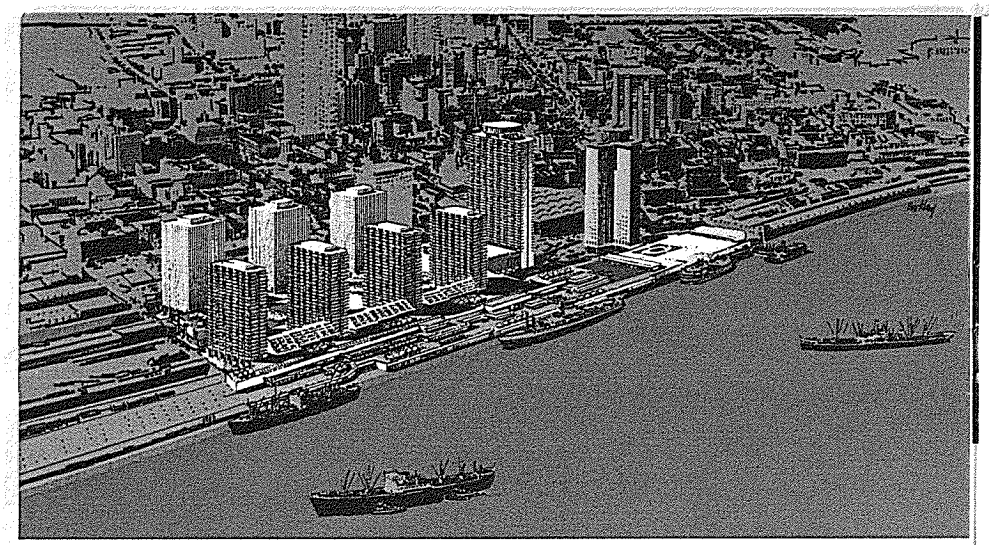
Alpine Meadows (top left), a major ski resort near Lake Tahoe, is on land leased from Southern Pacific and the Forest Service.

Geothermal steam sources, like these in Nevada (bottom left) are being explored for power and mineral potential by SP Land.

Bayport Industrial District (top), with 3,000 acres of good plant sites served by Southern Pacific rails near Houston's deep water shipping channel, is an example of where SP Land cooperates with other developers in locating industries on the most suitable sites.

Whirlpool Corporation's new $1 million office and warehouse in Santa Clara, Calif.—with space to stock 200,000 major appliances—was designed and built by Sequoia Pacific to Whirlpool specifications.

Air or land trips to possible locations are among Industrial Development Division services for site-seekers. Community tours to assess nearby commercial and residential areas may be included.



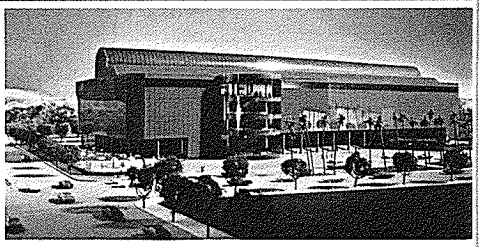
Real Estate Division Upgrades Former Operating Properties

Times change, now faster than ever. Constant evolution of Southern Pacific's diversified operations frequently alters its needs for property. SP Land's Real Estate Division handles such transactions for the entire family of companies. It buys land for line changes, railroad yard expansion, and microwave stations, pipeline pumping stations, tank farms and truck terminals, obtains easements for pipeline or coaxial cable, and even handles real estate of transferred employes.

The division really applies its talents, however, in converting marginal or non-productive properties into earning assets. At Fisherman's Wharf in San Francisco, for instance, an old auto unloading dock became the site of a modern, successful 354-room motel.

Pictured on this page are two similar redevelopments: The Pacific Design Center is being built where SP's former Pacific Electric Railway subsidiary used to have its West Hollywood yards. And the impressive International River Center is going up in New Orleans at the foot of Canal and Poydras Streets, where trackage and warehouses have long occupied 23 acres of prime downtown land. The tracks are being relocated and 16 acres freed for the $80 million project.

Downtown areas of several cities are being revitalized by new uses for surplus railroad operating property, such as attractive low-rise apartments in Baldwin Park and a major shopping center in Livermore, to cite two California examples. In Reno, a 320-room hotel and casino is planned to utilize the air rights above the main-line tracks.



International River Center (top) is a multi-use project going up along the Mississippi River in downtown New Orleans. SP Development Company, in partnership with L&N Investment Company and the New Orleans International Hotel, is investing in a 1,200-room convention hotel, apartments, shops, restaurants and a cruise-ship passenger terminal. More apartment buildings, office space, department stores and a shopping mall will be added later.

Pacific Design Center (below) is a 700,000-square-foot central merchandise mart for Southern California's rapidly expanding wholesale interior design and home furnishings trade. Sequoia Pacific is developing the $26 million, six-story center in West Hollywood.

The new emphasis on putting property to its highest and best use is bringing substantial rewards. On some 12,000 commercial leases in 1972, rental of industrial and commercial property totaled $19 million.

Southern Pacific Helps Develop the West

On this page is the most famous picture in railroad history—the scene of May 10, 1869, on a lonely plateau at Promontory, Utah. Two tiny locomotives—at left the eastbound "Jupiter" of Central Pacific, at right the westbound No. 119 of Union Pacific—stood nose to nose on a single track with, in the words of poet Bret Harte, "half a world behind each back."

The founders of today's Southern Pacific had just helped drive the Gold Spike and complete America's first transcontinental railroad.

To people of that day, the event was as momentous as the landing of men on the moon just a century later—and the railroads' effect on life was much more immediate.

The railroads opened the American West. Where emigrants had taken months by wagon train, and even fast stages took 25 days and a Pony Express message 10 days from Missouri to California, a new settler now could move his family and belongings from coast to coast in seven days. His crops gained swift access to market; the San Joaquin Valley cattleman and wheat farmer had paid $50 a ton in freight rates by wagon to reach San Francisco, but the railroad cut that to $2. One was asked how he managed to upgrade his scrub cattle so quickly. "I crossed them," he replied, "with a Southern Pacific locomotive."

Westerners built our railroad, beginning with Texas entrepreneurs who in 1851 began the Buffalo Bayou, Brazos & Colorado Railway, the earliest part of the present SP system, at what is now Houston.

The Big Four—Huntington, Crocker, Stanford and Hopkins—were Sacramento merchants who brought Theodore Judah's dream of a transcontinental railroad to reality. They won Abraham Lincoln's approval, formed the Central Pacific Rail Road, and started laying track *from the West.* And they followed up the 1869 Gold Spike by driving other "last spikes" on many routes built under the Southern Pacific banner.

The Big Four parlayed their risks and energy into fortunes, but unlike the financial speculators who drove so many early railroads to ruin, they kept building both SP and the West.

There were a lot of wide, empty spaces on the new rail maps, and new settlers, new crops and new products were needed to provide traffic. SP and its Central Pacific predecessor carried on extensive advertising and some of the first modern promotional campaigns to bring people and new enterprises.

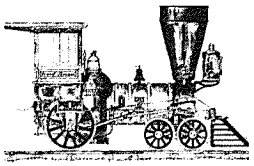
"Ho for California!" read a typical Central Pacific ad in 1875. "The Laborer's Paradise! Salubrious Climate, Fertile Soil, Large Labor Returns, No Severe Winters, No Lost Time, No Blight or Insect Pests!"

Tempted by the golden promise of the West and by extra-low fares, settlers crowded onto SP's "emigrant trains" with families, furniture and livestock. Fares for "land-seekers' tickets" could be applied against the purchase of railway land, which sold for $1 to $10 an acre on installments. Colonists traveling and settling together got group rates.

SP agricultural advisers helped develop new crops and irrigation methods. Refrigerator cars were devised to put western fruits and vegetables in distant markets. Exhibit trains—one was called "California on Wheels"—promoted western products and opportunities. SP lantern slide lecturers went as far as Europe to extol the sunshine and oranges and scenic wonders like Yosemite and the redwoods.

People came to settle, or just to see. By the early 1900s, Southern Pacific turned from finding colonists to attracting job and income-producing industries. The West had been won.

Mileposts in Southern Pacific's History



The "General Sherman," Locomotive No. 1 of the Buffalo Bayou, Brazos & Colorado Railway.

1851: Work starts on Buffalo Bayou, Brazos & Colorado Railway (Houston to Alleyton, Texas), oldest part of SP system.

1852: Construction begins on New Orleans, Opelousas & Great Western Railroad (New Orleans to Morgan City, La.), second oldest part of SP.

1855: First track laid for 23-mile Sacramento Valley Railroad (Sacramento to Folsom, Calif.), first railroad in West. Built by Theodore Judah, completed in 1856; now part of SP.

1861: Central Pacific Rail Road Company of California formed by Judah and the "Big Four"—Collis P. Huntington, Leland Stanford, Mark Hopkins, and Charles Crocker—to build transcontinental rail link from Sacramento eastward over Sierra Nevada.

1862: President Lincoln signs Pacific Railroad Act, authorizing construction of railroad between Missouri River and Pacific Coast . . . Union Pacific is organized to build line west from Omaha to meet the CP . . . New Orleans, Opelousas line fought over by Union, Confederate forces; Union finally operated as "U.S. Military RR" until 1866.

1863: Ground broken Jan. 8 for Central Pacific, Sacramento.

1864: CP starts service between Sacramento and Newcastle, with Locomotive No. 1—the "Governor Stanford." CP's third locomotive, the famous diamond-stacked "C. P. Huntington," later became honorary No. 1 of SP . . . San Francisco & San Jose RR completes Peninsula line between the two cities (became part of SP in 1870).

1865: California & Oregon Railroad, an SP ancestor, incorporated to build from Marysville, Calif., to Portland . . . Southern Pacific Railroad Co. (not initially related to CP or Big Four) is formed to build from San Francisco to San Diego, then eastward to meet another projected transcontinental railroad.

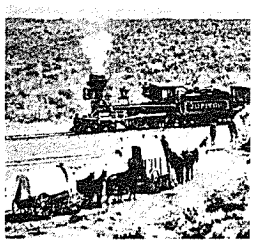
1867: CP construction in High Sierra; first snowsheds built.

1868: Central Pacific completes its line over the Sierra. Reno, Carlin and other Nevada towns staked out by CP engineers. Track building races across Nevada at mile a day . . . Big Four on Sept. 25 acquire the Southern Pacific (and reincorporate it in 1870).

1869: CP's Chinese and Irish forces lay 10 miles of track in one day as they race toward Promontory, Utah. The historic "Gold Spike" ceremony takes place May 10, marking completion of first transcontinental railroad . . . Sacramento and San Francisco linked by rail via Lathrop . . . CP begins building San Joaquin Valley line south from Lathrop . . . Regular Sacramento-Omaha train schedules established. First train of Silver Palace Sleeping Cars reaches Alameda, Calif., after 6½-day run from New York.

1870: CP-SP begin major programs to attract settlers to West.

1872: Occidental & Oriental Steamship Co. founded by Big Four to develop trade with Orient . . . Houston & Texas Central Railroad, now part of SP, operates first train into Dallas . . . Fresno, other San Joaquin Valley towns laid out by railroad as line moves south . . . Rails reach Redding.



Governor Stanford's special train, heading eastward in 1869 to the Gold Spike ceremony, stopped near Utah's Great Salt Lake to meet the last wagon train heading westward on the Overland Route.

1873: General Offices move from Sacramento to San Francisco.

1874: Line reaches Bakersfield and engineers design Tehachapi Loop to conquer the mountains . . . Western Development Co. formed to attract tourists and colonists.

1876: Charles Crocker drives gold spike at Lang (near Palmdale) completing San Joaquin Valley line linking Los Angeles with San Francisco and the East . . . Special "Lightning Express" makes run from Jersey City to Oakland and thence by ferry to San Francisco in 84 hours, 17 minutes.

1877: SP reaches Yuma—first railroad in Arizona . . . Galveston, Harrisburg & San Antonio Railroad, now part of SP, operates first train into San Antonio . . . Tyler Tap Railroad Co., first component of Cotton Belt, begins operating in Texas.

1879: SP tries burning oil in locomotives (adopted for general use after 1900).

1880: Line completed from Los Angeles to Tucson . . . CP purchases Pacific Mail steamship line operating to Far East.

1881: First train arrives in El Paso . . . Connection with AT&SF at Deming, N.M., forms second transcontinental rail route . . . First through train, New Orleans to Houston.

1883: Last spike driven Jan. 12 near Pecos River, Texas, completing Sunset Route from Los Angeles to New Orleans. Eastern link—Morgan's Louisiana & Texas Railroad & Steamship Co.—acquired with steamship lines to New York (operated until World War II) . . . Huntington begins Mexican International Railroad from Eagle Pass, Texas, to Durango, Mexico. This 900-mile line was completed in 1892; sold in 1910 . . . Mojave-Needles line completed; conveyed to A&P (Santa Fe) in 1884 . . . Silver spike driven August 12 at Rob Roy, Ark., to celebrate completion of Cotton Belt Route (Texas & St. Louis Ry.) from Bird's Point, Mo., to Gatesville, Texas.

1884: SP Co. is incorporated in Kentucky, bringing numerous pioneer rail lines under its single banner.

1885: CP leased to SP . . . SP puts automatic air brakes on trains.

1886: Del Monte Hotel, most famous of several resorts operated by SP, built on Monterey Peninsula . . . Early refrigerator car developed by SP to move fresh produce across nation . . . Cotton Belt changed from narrow to standard gauge.

1887: SP takes over and completes Oregon & California Railroad, linking Portland with the SP system . . . Santa Fe and SP, in a fierce rate war, slash colonist fares from Missouri River to West Coast to $1 . . . First train to Santa Barbara . . . SP leases South Pacific Coast RR . . . New shops built at Houston . . . First built-in vestibules between passenger cars.

1888: SP promotion campaign sends "California on Wheels" trains to Middle West to exhibit Golden State's products . . . Famed Arcade station opens in Los Angeles . . . Cotton Belt reaches North Little Rock, Shreveport and Fort Worth.

1890: Sequoia National Park formed with strong support from SP. (Ten years later, SP helps bring Yosemite Valley into National Park System.)

1894: Coast Line opened south to San Luis Obispo.

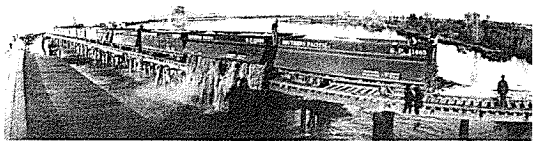
1898: SP acquires Sonora Railway to Guaymas, Mexico. SP Railroad Co. of Mexico formed in 1909 to extend line along west coast to Guadalajara; completed in 1927 (total mileage: 1370) and sold to Mexican Government in 1951 . . . SP begins publication of "Sunset Magazine" as part of campaign to bring settlers to West. "Sunset" was sold in 1914 to private publisher.

1900: C. P. Huntington, last of "Big Four," dies.

1901: E. H. Harriman, who won control of Union Pacific in 1897, moves into SP as chairman of executive committee, then as president, with 45% ownership of SP stock . . . "Colonist fares" from Chicago and Missouri River points to Coast of $33 and $25 bring nearly 800,000 settlers to West over SP between 1901 and 1916 . . . Coast line, via Santa Barbara, completed.

1902: El Paso–Santa Rosa & Tucumcari, N.M., connection made with Rock Island . . . Pacific Electric organized in Southern California (SP acquired half PE in 1903, remainder in 1910.) . . . CP line rebuilt through Nevada.

1903: SP sends lecturers abroad to attract immigrants to West . . . Cotton Belt gains access to St. Louis . . . SP starts converting all locomotives to oil.



The Colorado River overflowed in 1905-07, creating the Salton Sea and threatening to inundate California's Imperial Valley. After a long battle, SP forces sealed the break at a cost of about $3 million.

1904: Original "Gold Spike" route around Great Salt Lake, Utah, becomes a branch line as the Lucin Cutoff, involving a trestle and fill across lake, is opened . . . Wadsworth, Nev., terminal moved to Sparks.

1905: Colorado River floods almost wash Southern California's Imperial Valley out of existence. SP takes on two-year fight to return river to its channel, moves its rails many times as Salton Sink becomes an inland sea.

1906: San Francisco earthquake and fire. SP rushes relief supplies and evacuates 224,000 persons. Fire destroys General Offices at 4th & Townsend Sts. . . . Pacific Fruit Express incorporated by SP and UP . . . Nation's first steel passenger car built at Sacramento shops.

1907: Northwestern Pacific Railroad formed, with SP and Santa Fe as joint owners, from 41 small predecessor companies. SP took over sole ownership of NWP in 1929 . . . Nine-mile Bayshore cutoff leading out of San Francisco opened . . . SP finally closes Colorado River break to save Imperial Valley, at total cost over $3 million.

1908: Rocklin, Calif., terminal moved to Roseville.

1909: Last of Central Pacific's debt to government for construction financing paid off—a total of $77.1 million, including interest, for original loans of $27.8 million in bonds . . . E. H. Harriman dies.

1910: First cab-ahead "Mallet" engines on SP.

1912: Cotton Belt reaches Memphis.

1913: Supreme Court decrees UP must sell its SP stock . . . Including suburban trains, SP operates about 1400 trains a day.

1915: Panama-Pacific Exposition in SF causes passenger traffic to jump 65%. SF's Third Street Station, LA's Central Station open . . . Pacific Mail Line steamships discontinued.

1917: Present General Office Building opens in San Francisco . . . Federal government takes over U.S. railroads from December, 1917, to March, 1920.

1919: San Diego & Arizona Railway (a subsidiary; later the San Diego and Arizona Eastern) completed to El Centro in the Imperial Valley.

1923: SP control of CP found to be in public interest by Interstate Commerce Commission.

1924: El Paso & Southwestern system, extending from Tucson to El Paso, and north to Tucumcari, merged into SP by exchange of stocks and bonds.

1925: Double-tracking of CP line over Sierra, including construction of 10,326-foot tunnel, completed.

1926: SP purchases narrow gauge Nevada-California-Oregon Railway; widens and extends its line to Klamath Falls in 1929 to form the Modoc Line . . . Cascade Line (Oregon) opened . . . Main line through Phoenix completed.

1927: SP Motor Transport Co. begins bus operations in Oregon. Service later extended to other states; subsequently sold to Greyhound . . . Line to Rio Grande Valley (Falfurrias to Brownsville, Texas) completed.

1929: Pacific Motor Transport Co. begins first SP truck operations . . . SP assumes full ownership of Northwestern Pacific.

1930: Coordinated train-truck overnight merchandise freight service established . . . $10 million Martinez-Benicia bridge across Suisun Bay, near San Francisco, completed; Sacramento River steamers discontinued . . . First centralized traffic control installed, 40 miles between Sacramento and Stockton . . . Peak year of SP ferryboat service on San Francisco Bay; 43 boats (world's largest fleet) carry 40 million passengers and 6 million autos.

1932: Revenue ton-miles drop 50% from 1929 level due to Depression . . . SP gains control of St. Louis Southwestern (Cotton Belt) . . . Petaluma & Santa Rosa RR acquired.

1936: "City of San Francisco," first diesel-powered train on SP, placed in service between Chicago and San Francisco . . . Bridges built across San Francisco Bay spell doom for SP ferryboats.

1937: Sacramento Shops build their last steam locomotive; more than 200 built in previous 63 years . . . Streamliners introduced; Coast Daylight, Californian, 49er, Cascade, Challenger, Sunbeam.

1939: Official headquarters moved from New York to San Francisco . . . Last SP commuter ferry run on San Francisco Bay . . . Interurban Electric Railway (SP subsidiary) begins service between San Francisco and East Bay via Bay Bridge; discontinued in 1941 . . . First diesel switchers appear on SP . . . First radio installation in Sierra to fill in for wire line in emergencies.

1941: World War II—19,980 SP men and women eventually join armed services . . . Last runs of NWP's Marin electric trains and ferries . . . Morgan Lines' Gulf-Atlantic service ends as ships taken for war duty.

1942: Promontory, Utah, scene of Gold Spike ceremony in 1869, ceases to be on the railroad map as last rails are removed in wartime scrap drive.

1944: Peak year of huge war-time freight and passenger traffic . . . Last new steam locomotive goes into service . . . New Pecos River High Bridge completed.

1945: Start of SP's $2 billion postwar improvement program . . . Congress finally repeals low "land grant rates" for government traffic; railroads paid for land grants nearly 10 times over, by time reduced rates ended in October, 1946.

1947: First main line diesel freight locomotives put into service . . . Corporate residence of SP moved from Kentucky to Delaware.

1948: "Golden State" first new postwar streamliner inaugurated, followed with much fanfare by "Shasta Daylight" and "Starlight" (1949), "Cascade" and "Sunset Limited" (1950).

1950: Train radios installed on Bakersfield-Los Angeles freights.

1951: First tape-to-card installations for SP's mechanized car reporting . . . Mexican government buys SP de Mexico.

1952: "City of San Francisco" marooned for three days by raging blizzards in the Sierra; rescued with no major passenger injuries . . . Earthquake twists rails and damages tunnels on Tehachapi line; reopened in 25 days . . . "Push-button" yard opened at Roseville.

1953: SP starts "piggyback" hauls of truck-trailers on railroad flat cars.

1954: $4 million Puente By-Pass built to speed traffic around Los Angeles terminal area . . . SP passenger train losses reach $58 million, as new freeways, airliners win customers away.

1955: SP, working in conjunction with Stanford Research Institute, develops Hydra-Cushion freight car which gives superior protection to fragile freight. Now in use on many railroads.

1956: First SP pipeline for refined petroleum products goes into service from West Texas and Southern California into Arizona . . . Englewood Yard, using advanced electronics to classify cars, opened at Houston . . . First ribbon rail.

1957: SP's motive power is fully dieselized.

1958: Last SP ferry on San Francisco Bay . . . Last steam engine makes symbolic run from San Francisco to Reno.

1959: $53 million earthfill causeway across Great Salt Lake completed, replacing wooden trestle built in 1904 . . . To spur heavier loading of freight cars, SP introduces incentive rate program.

1960: New bi-level and tri-level freight cars to haul new automobiles prove highly successful . . . SP and IBM begin work on development of Total Operations Processing System.

1961: Texas and New Orleans Railroad Co. merged into SP Co.

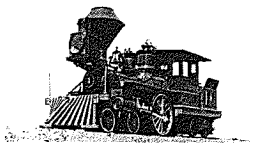
1962: Diversification efforts suffer setback when ICC denies application by SP and Illinois Central to acquire John I. Hay barge line . . . SP is first railroad to join President Kennedy's "Plan for Progress," pledging to be an equal opportunity employer . . . Container service begins . . . First major microwave installation, Fresno-Los Angeles.

1963: Larger freight cars gain more traffic with incentive rates . . . SP proposes purchase of southern half of Rock Island.

1964: Severe storms and floods cause $15 million damage to the Northwestern Pacific in Northern California and to SP lines in Oregon. NWP restores 100 miles of flood-damaged railroad to service by June 1965 . . . SP acquires Bankers Leasing Corp. of Boston, one of the nation's largest leasing companies.

1965: Consolidated revenues from all SP operations exceed $1 billion for the first time . . . ICC rejects SP's bid to acquire control of Western Pacific Railroad . . . Pacific Electric Railway Co. merged into SP.

1966: Black Mesa Pipeline formed as SPPL subsidiary to build world's longest coal slurry line.



"The C. P. Huntington," built in 1863, was CP's third locomotive and later became SP's honorary No. 1. It was given to the State of California and will reside in a new railroad museum planned for Sacramento.

1967: 78-mile Palmdale-Colton Cutoff completed at cost of $22 million, permitting SP trains to by-pass Los Angeles. This is longest new railroad line built in the U. S. in a quarter-century . . . Post Office takes mail off passenger trains . . . Computerized classification yard opened at Eugene.

1968: First units of $22 million Total Operations Processing System placed in service . . . Nation's first videotape filing system helps SP retrieve waybills by "instant replay" . . . Peninsula commute fleet adds 15 new doubledeck cars . . . Computerized automatic classification system added to Houston's Englewood Yard.

1969: Corporate reorganization of Southern Pacific Co. into a holding company whose principal asset is Southern Pacific Transportation Co. . . . TOPS On-Line Services, Inc., and Southern Pacific Communications Co. formed as subsidiaries . . . Pipeline completed under San Francisco Bay to SF International Airport . . . Centennial of Gold Spike ceremony celebrated May 10.

1970: Black Mesa Pipeline opens 273-mile coal slurry line in northern Arizona . . . Vert-A-Pac cars developed in joint effort with General Motors; each carries 30 sub-compact autos loaded vertically . . . First unit trains of autos and auto parts operate from Midwest to West Coast . . . Southern Pacific Land Co. reorganized and Southern Pacific Development Co. formed in new emphasis on land management activity.

1971: Amtrak takes over operation of intercity passenger trains May 1 . . . Construction begins on West Colton yard . . . Stac-Pac containers developed with GM to protect full-sized autos from damage in transit . . . Both SP and Cotton Belt win Harriman Gold Medals for best safety records of U.S. railroads.

1972: Revenues and earnings set records; nearly 81 billion ton-miles of freight carried . . . Record $290 million invested in capital improvements, with a big new freight car program announced for 1972-73 . . . ICC authorizes Cotton Belt purchase of half of Alton & Southern Ry . . . FCC grants first authority for SP Communications Co. to build specialized common carrier system.

SP Chief Executives

Leland Stanford: President, Central Pacific, 1861-93; President, Southern Pacific, 1885-90; Chairman, Executive Committee, 1890-93.

Collis P. Huntington: President, 1890-1900.

Charles H. Tweed: Chairman of Board, 1900-1903.

Charles M. Hays: President, 1900-1901.

Edward H. Harriman: Chairman, Exec. Comm. and President, 1901-09.

Robert S. Lovett: Chairman, Exec. Comm., 1909-13; President, 1909-11.

William Sproule: President, 1911-18 and 1920-28.

Julius Krutischnitt: Chairman, Exec. Comm., 1913-25; President, 1918-20.

Henry W. de Forest: Chairman, Exec. Comm., 1925-28; Chairman of Board, 1929-32.

Hale Holden: Chairman, Exec. Comm., 1929-32; Chairman, 1932-39.

Paul Shoup: President, 1929-32; Vice Chairman, 1932-38.

Angus D. McDonald: Vice Chairman, Exec. Comm., 1925-32; President, 1932-41.

Armand T. Mercier: President, 1941-1951.

Donald J. Russell: President, 1952-64; Chairman, 1964-72.

Benjamin F. Biaggini: President, 1964-.

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This special "This Is Southern Pacific" issue was prepared by the Southern Pacific Public Relations Department, One Market St., San Francisco, Ca. 94105, for Southern Pacific shareholders, its active and retired employes, and others interested in the nation's most diversified transportation system.

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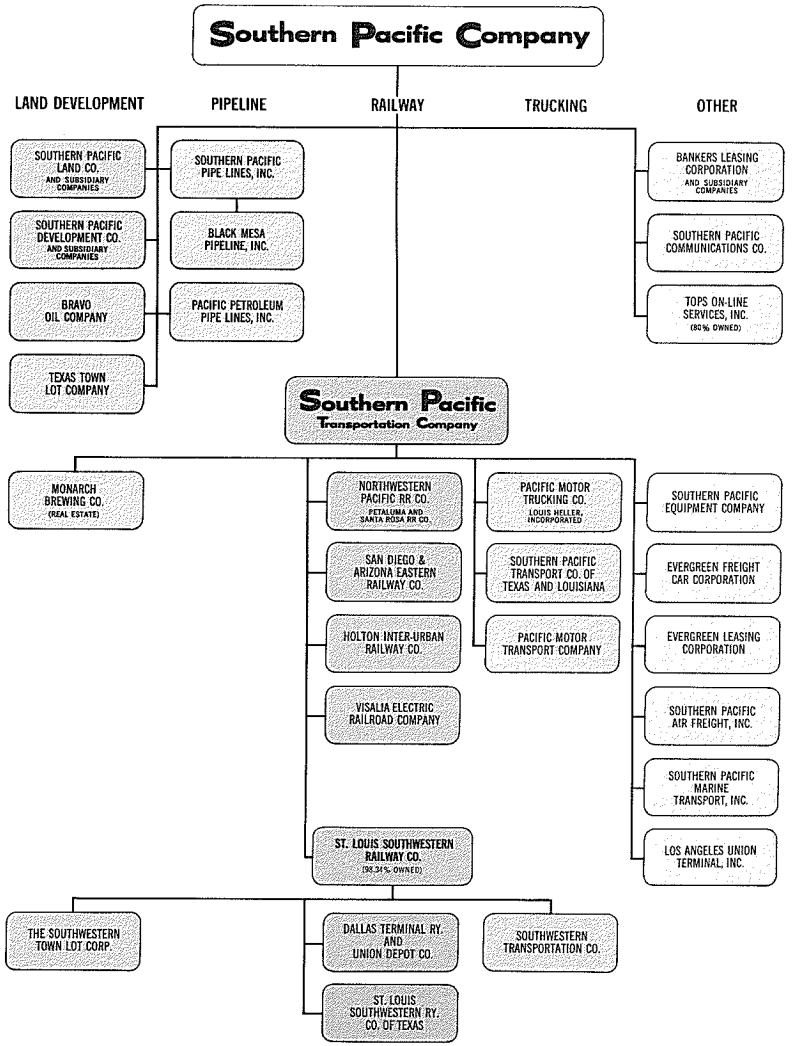
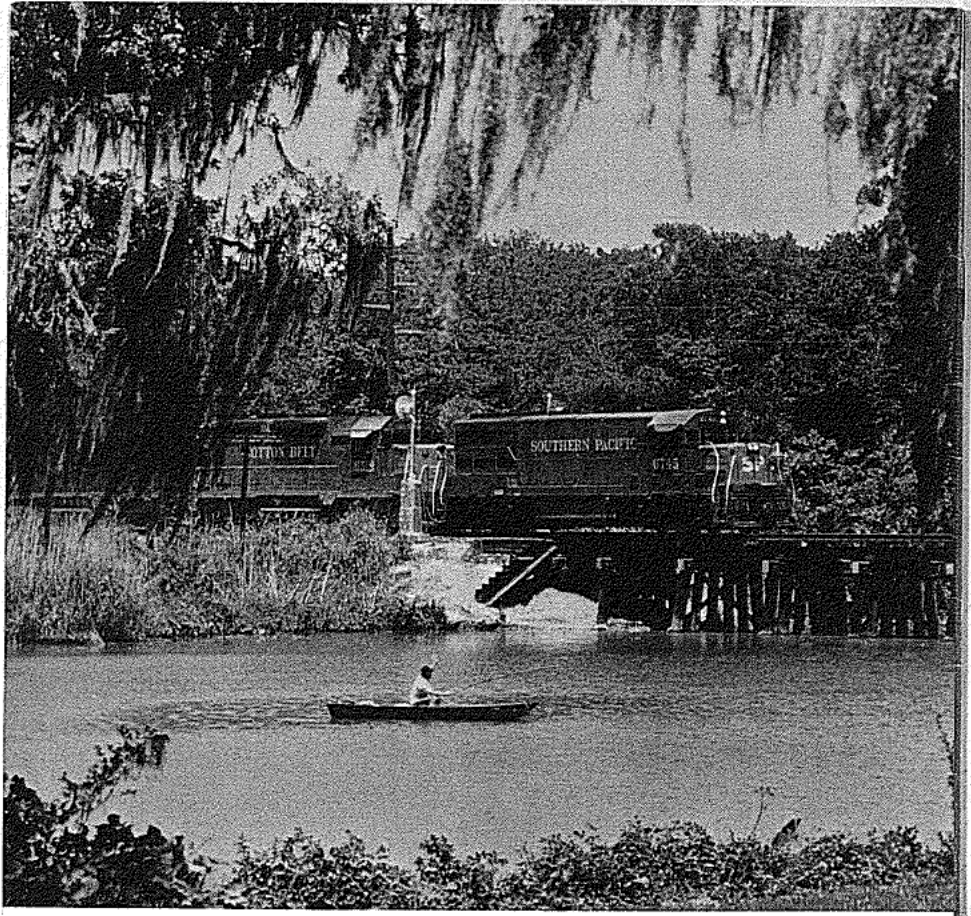
Southern Pacific Company and Consolidated Subsidiary Companies—grouped by industry





Crossing Bayou Ramos near Morgan City in Southern Louisiana

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